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Forest Service
Tongass National Forest

Alaska Region

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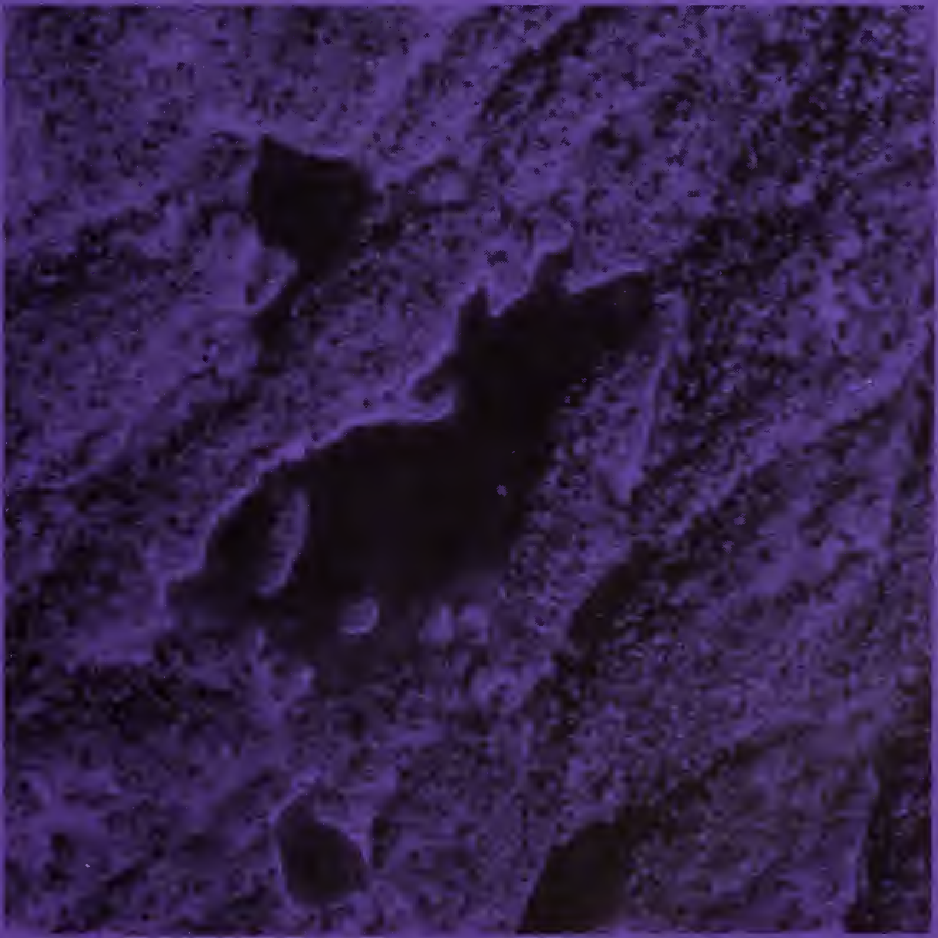
April 2000

FINAL
EIS
ENVIRONMENTAL
IMPACT
STATEMENT
and

RECORD OF DECISION

SKIPPING COW TIMBER SALE

Tongass National Forest



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File Code: 1950
Date: April 28, 2000

Dear Reader:

Attached is the Record of Decision (ROD) and the Final Environmental Impact Statement for the Skipping Cow Timber Sale on the Tongass National Forest.

Additional copies of the Final EIS are available for review at Forest Service Offices in Wrangell and Petersburg. Copies have also been sent to libraries throughout Southeast Alaska.

The ROD documents my final decision on the Selected Alternative, and the factors considered in reaching the decision. The effective date of implementation for the decision and the Notice of Rights of Appeal are also specified in the ROD.

I want to thank those of you who took the time to review and comment on the Draft Environmental Impact Statement. Your interest in the management of the Tongass National Forest is appreciated.

As the Assistant Forest Supervisor, I am responsible for this decision. Please direct any correspondence or requests for additional copies to Jerry Jordan, Skipping Cow Team Leader, P.O. Box 51, Wrangell, AK 99929; or to the e-mail address: jjordan@fs.fed.us.; or call (907) 874-2323.

Sincerely,

for Fred S Salinas
CAROL J. JORGENSEN
Assistant Forest Supervisor
Tongass National Forest

Skipping Cow Timber Sale Record of Decision

Introduction

This Record of Decision (ROD) documents my decision to select an alternative from the Skipping Cow Timber Sale Final Environmental Impact Statement (Final EIS). This Decision includes the specific location and design of timber harvest units and roads, protection requirements for harvesting timber, and reconstruction of the log crib equipment off-loading bulkhead in Roosevelt Harbor. The timber harvest may be sold in several sales of varying sizes. In addition, this Decision includes the implementation of road management objectives such as culvert and bridge replacement, maintenance and road closures.

Background

The purpose and need for the proposed timber harvest is to respond to goals and objectives identified by the Forest Plan and to move the project area toward the desired future condition for all resources. The Forest Plan identified the following goals and objectives, which are applicable to Skipping Cow:

1) Manage the Tongass timber resource for production of saw timber and other wood products from suitable timber lands made available for timber harvest, on an even-flow, long-term sustained yield basis and in an economically efficient manner (Forest Plan, page 2-4).

2) Seek to provide a timber supply sufficient to meet the annual market demand for Tongass National Forest timber, and the demand for the planning cycle (Forest Plan, page 2-4).

3) Maintain and promote industrial wood production from suitable timber lands, providing a continuous supply of wood to meet society's needs (Forest Plan, page 3-135 and 3-144).

4) Produce desired resource values, products, and conditions in ways that also sustain the diversity and productivity of ecosystems (Forest Plan, page 2-1).

5) Support a wide range of natural resource uses and employment opportunities within Southeast Alaska's communities (Forest Plan, page 2-3).

Public Scoping

Public scoping began with the Notice of Intent to prepare an EIS published in the *Federal Register* on July 8, 1998. A Draft Environmental Impact Statement (Draft EIS) was distributed in July 1999 and the comment period lasted until the end of September 1999. This ROD and the Final EIS disclose the environmental effects of the alternatives considered and document my decision to authorize the project and associated activities.

In developing the Final EIS and this ROD, I recognize that less than complete knowledge exists about many relationships and conditions of wildlife, fish, forests, jobs, and communities. The ecology, inventory, and management of a large forest area is a complex and developing science. The analysis of wildlife species prompts questions about population dynamics and habitat relationships. The interaction between resource supply, the economy, and communities is not an exact science.

The data and level of analysis used in the Final EIS were commensurate with the importance of the possible impacts (40 CFR Code of Federal Regulations (CFR) 1502.15). When encountering a gap in information, the interdisciplinary team (IDT) took one of two approaches: (1) they collected the missing information or conducted the analysis necessary to identify important relationships, or (2) they concluded that, although the missing information would have added precision to estimates or better specified a relationship, the basic data and central relationships are sufficiently established in the respective sciences so that new information would be very unlikely to reverse or nullify understood relationships. As such, information missing from the Final EIS was not determined to be essential for a reasoned choice among the alternatives.

Decision

This Record of Decision documents my decision to implement activities in the Skipping Cow Project Area. My decision encompasses the following:

- Whether or not timber should be made available for harvest;
- If timber is to be harvested, the location and design of timber harvest units;
- If roads are to be built, the location and design of road systems;
- If facilities are to be built, the location and design of log transfer facilities;
- If roads are constructed or used, road management objectives including closures for resource protection and economics;
- Standards and guidelines, mitigation measures, and enhancement opportunities for resources other than timber;
- Whether there may be a significant restriction on subsistence use and if so, related findings and measures to minimize impacts on subsistence users; and

It is my decision to choose Alternative 5 with road management Option B, as modified by this Record of Decision, as the Selected Alternative for implementation in the Skipping Cow Project Area. Based on agency and public comments received during the comment period on the Draft Environmental Impact Statement, I have made some modifications to Alternative 5 to reflect this input. These changes to Alternative 5 are detailed below and are specifically incorporated into the final decision.

This decision meets the purpose and need for the project; is consistent with the April 1999 Tongass National Forest Land and Resource Management Plan Record of Decision; and is responsive to issues raised during scoping, to information gathered during the environmental analysis, and public and agency comments on the Draft EIS.

Specifically, I select Alternative 5 and I authorize the required actions to implement this decision. Furthermore, I modify Alternative 5, making the following unit and road management changes to provide increased resource protection in response to public and agency input received on the Draft Environmental Impact Statement:

- When logging on the Skipping Cow Timber Sale is complete, all drainage structures will be removed on the new 52033 Road. This road accesses Nesbitt Ridge which includes two culverts in larger incised draws. Boulders and other road closure devices will be placed to make these stream crossings effective barriers to motorized use. Additional closure devices will be placed at the beginning of this road to eliminate motorized use after the closure of the sale.

- In addition, due to the importance of the Nesbitt Ridge as summer and fall deer habitat, the Forest Service will impose a Forest order prohibiting motorized use on Road 52033 or within ¼ mile of it from April 1 to December 21 of any year following this sale. Incidental snow machine use will be allowed during the months of January, February, and March.

- During the life of the Skipping Cow sale, Road 52033 will be gated and only authorized administrative use of the road will be allowed under a Forest order.

- Based on input from local subsistence hearings and after consultation with the Alaska Department of Fish and Game, the road closures on the new Vial Creek and Middle Meter Bight road systems (Roads 6594 extension and 52034, respectively) will be made with berms (not gates) and will allow, where practicable, ATV use on these roads. This will respond to concerns heard at the subsistence hearings held for this project, that this type access is important to local hunters for subsistence purposes.

- The prescriptions for the lower one-third of the slopes in units 5 and 6 will be modified so as to remove no more than 25% of the trees over 9 inches in diameter to retain habitat value for deer.

- Most leave trees to be left in units 5, 6, 8, 18, 20, 21, and 25 will be located on the lower one-third of the slope because this portion of the slope appears to be less exposed to large scale wind throw.

- Unit 2 will be laid out to allow at least a 200 foot wide screen of trees for deer cover and travel between unit 2 and the older existing clearcut near the southeast corner of unit 2.

- Portions of units 6, 19, 21, and 24 which appeared to be isolated in the Draft EIS have been corrected either through unit design changes or with improvement of the mapping between Draft and Final EIS.

- We have clarified in the Final EIS that the retention of 5 large trees per acre (included in the 10% retention of trees over 9 inches in diameter) in units 12, 13, 14 and 15, are to serve as legacy trees to benefit the future for murrelets and other wildlife species dependent on larger standing trees. We also specify that we will use cruise data to select a diameter that will leave at least 5 larger trees per acre in these units.

- Text changes have been made in the Final EIS regarding explanations of the deer model and rationale for the habitat value placed on low elevation, southern exposure, harvest units as requested by some commentors.

- Some commentors requested additional information about log transfer facilities. This information has been included in the Final EIS.

- Additional mitigation or design features described for Alternative 5 in the Final EIS are a part of this decision except as modified above.

Unit Cards for the Selected Alternative as modified by my decision have been included as an appendix to this Record of Decision.

Highlight Features of the Selected Alternative:

1) The Selected Alternative will harvest timber from approximately 906 acres in the project area. This harvest will provide an estimated 19 million board feet of sawlog and utility volume based on stand examination estimates of unit volume. Actual cruised volume may vary. Design features of the 21 selected harvest units are described in detail on the Unit Cards in Appendix 1 attached to this Record of Decision. The Selected Alternative will manage the Roads as displayed in the Road Cards shown in Appendix C of the Final EIS.

2) The equipment off-loading bulkhead in Roosevelt Harbor will be reconstructed within the existing footprint.

3) Either or both of the existing Deep Bay or St. John Log Transfer Facilities (LTF) would be used to transfer logs directly to barges or into the water for rafting.

4) There may be land-based logging camps within the Deep Bay or St. John Harbor Area or the timber purchaser may locate a floating camp either in Deep Bay, or St. John Harbor. Both of these sites have been used previously for floating and land-based camps, and the operator of the camp will be responsible for securing appropriate permits from state and federal agencies.

5) This Record of Decision identifies mitigation measures to reduce or eliminate adverse environmental effects of timber harvest specified in the Selected Alternative. It also specifies the implementation and effectiveness monitoring planned to determine how well resource management objectives have been met. In addition, the ROD identifies feasible enhancement opportunities following implementation of this alternative. These opportunities will be included in the Sale Area Improvement Plan developed for the timber sale.

6) I have determined that the effects of the Selected Alternative on the subsistence use of resources in the Project Area are minimal. The direct effects from the action alternatives in the Skipping Cow Project Area do not present a significant possibility of a significant restriction of subsistence uses of wildlife, fish and shellfish, marine mammals, other foods, and timber resources. The potential foreseeable and cumulative effects from implementing the Forest Plan through the entire rotation period, including the no-action and action alternatives in the Project Area, do not present a significant possibility of a significant restriction of subsistence uses of deer, wolf and other resources. Mitigation measures suggested for minimization of impact to subsistence resources suggested through agency and public scoping have been incorporated into the Selected Alternative.

Reasons for the Decision

1) In making my decision, I considered the many issues raised during the development and scoping of this project, Forest Plan and Record of Decision standards and guidance for the project area, and took into account competing interests and values of the public. Many divergent public, and agency opinions were expressed during the analysis. These comments have helped make this a better decision. I have considered all views that have been expressed, utilized input where feasible and consistent with the purpose and need of the project, and feel that my decision is reasonable.

The Selected Alternative provides a beneficial mix of resources for the public within the framework of the existing laws, regulations, policies, public needs and desires, and capabilities of the land, while meeting the stated purpose and need for this project. This decision is one suited to this project area. The Skipping Cow project area presents unique challenges and opportunities due to its location, physical geography, timber stand composition, wind patterns, and the human social

and resource use patterns that have evolved in the project area over time. I believe the Selected Alternative best meets the goals and objectives developed for the area under the Forest Plan and balances site-specific concerns unique to the project, while achieving the purpose and need of the proposal.

2) My decision to implement this Selected Alternative conforms to the Forest Plan and sound National Forest management. Alternative 5 limits harvest to about 906 acres and is consistent with direction in the April 1999 Tongass Land and Resource Management Plan Record of Decision related to the standard for 200 year rotations in the project area. I have considered the need to help provide a sustained level of timber supply to meet annual and Forest Plan planning cycle market demand, and to provide diverse opportunities for natural resource employment, consistent with multiple use and sustained yield of all renewable forest resources. The Skipping Cow timber sale project will help meet Southeast Alaska timber supply needs.

3) The Selected Alternative builds 10.7 miles of specified road and 3.9 miles of temporary road. This sale is unique in that most of the roads can be built upslope from the harvest units. Uphill yarding will greatly increase the ability to leave a greater amount of the retention in the lower elevations of some units, which is the area that is less prone to large scale windthrow. Roads and their associated use were a common issue or concern in public and agency comments we received on the Draft EIS and in response to scoping. With the road management option selected and as modified by this decision, a compromise was reached by not allowing motorized access into the Nesbitt Ridge area, to reduce deer disturbance in summer and fall while allowing ATV access into the Vial Creek and upper Middle Meter Bight Creek areas. Managing the road in the Nesbitt Ridge area in this fashion will allow the significant economic advantage of cable logging in a timber management land use designation area, while the physical closure and forest order prohibiting motorized use of this road will mitigate possible negative impacts of too much access to an area that is an important summer and fall refuge area for deer.

4) The Selected Alternative uses cable harvest, with logs trucked to Deep Bay or to St. John Harbor LTF's. Cable harvest in this area is physically feasible for each unit that has been planned. The associated road building to access these units can be done in an environmentally sound and cost-effective manner. The combination of cable yarding with road building is highly compatible with Forest Plan direction for this area (see Final EIS for more detail on Forest Plan guidance relative to the project area). The Selected Alternative has a positive net stumpage in all but the very lowest markets. ($134.47/MBF in high market and -$21.25/MBF in low market conditions). The availability of a timber sale that can be economic even in lower economic cycles is an important economic benefit to the Tongass timber sale program as a whole.

   The project presents a unique combination of terrain, physical characteristics, social and environmental features, and Forest Plan direction. The adaptations I have made to Alternative 5 have been made to mitigate any significant negative

environmental or social effects. Alternative 5 harvests the least acreage of any of the action alternatives in order to balance wildlife, 200-year rotation considerations, and windthrow effects. The resultant alternative, however, still yields a project that will likely result in an economically viable sale in most (but not all) market conditions.

I received comments pointing out that helicopter yarding and partial cut harvests have been used more extensively on other recent sales on the Wrangell District. However, I believe that the unit configurations and harvest prescriptions in Alternative 5, as modified by my decision, reflect a reasoned balancing of the physical conditions and economic opportunities unique to this project area. These conditions cannot be directly compared to projects in different land use designations with different environmental and social concerns. The terrain, stand conditions, visual screening, economic opportunities and the Forest Plan guidance for the Skipping Cow project area are, in their combination, unique to this area. I believe Alternative 5, as modified, best meets the purpose and need for the proposal.

5) The Selected Alternative largely utilizes even-aged harvest prescriptions with retention of at least 10% of the trees per acre within stands. The prescriptions chosen are based on a unit by unit consideration of many factors which are described in Chapter 3 of the Final EIS and in the ROD Unit Cards. The terrain in the project area allows for relatively low impact road construction that is highly compatible with cable yarding. Significant adverse effects to soils, water, or fisheries are not anticipated due to the road and unit locations selected in Alternative 5. The resultant stands are largely screened from view as discussed in Chapter 3 of the Final EIS. Key viewpoints are at a distance from the project area. The selected prescriptions will allow for rapid regeneration, including spruce, will help mitigate mistletoe, and will be economical to harvest. All of the features listed above are desired conditions in a timber management land use designation under the Forest Plan, in which, all the harvest units in the Skipping Cow project are located.

6) Many of the units, particularly on the upper portions of the slopes appear to have originated from a large wind event. Windthrow has been, and will continue to be, a natural phenomenon in the project area. The analysis in Chapter 3 of the Final EIS leads me to believe that the combination of unit locations and harvest prescriptions used in Alternative 5 best mitigates and responds to the exposure of much of the project area to larger scale windthrow by harvesting progressively into the prevailing wind. My rationale in comparing the alternatives in regard to this issue follows:

Alternative 2, particularly in the Nesbitt Ridge area, would leave about 30 percent of the trees remaining in harvest units. In such a situation, based on past timber sale harvest experience, there is the distinct possibility of accelerating blow down among the trees left behind. Alternative 2 would, because of the more numerous units on Nesbitt Ridge, tend to have more unit edge related blow down than Alternative 5 and would be similar to Alternative 3 in this regard.

Alternative 3, though leaving less trees within units that would be exposed to the wind, creates more edge exposed to wind than does Alternative 5.

Alternative 4 would partial cut harvest about 25% of most of the stands in the Nesbitt Ridge area. Though this type of approach would emulate small scale blowdown it would remove 25% of the trees in a large area where larger scale blowdown events have occurred (particularly on the upper 2/3rd of the slope) in the Nesbitt Ridge area. Though predicting the windthrow is very difficult, I felt that Alternative 5 would have more predictable effects in minimizing the acceleration of windthrow in the area. The extensive light harvest throughout the stands prescribed in Alternative 4 on about (1000 acres along Nesbitt Ridge) could actually result in increased blowdown within the stands. Depending on the extent of such blowdown, there might be little opportunity for economic salvage of such trees since access to this portion of the project area would be relatively distant from any road system.

For these reasons, related to the issue of minimization of accelerated windthrow, I prefer Alternative 5 over the other action alternatives.

7) The Selected Alternative retains the best interior wildlife travel corridor between the Round Point and Snow Pass Old-growth Reserves. In addition, units 6 and 8 have been widely spaced in order to mitigate for potential windthrow along the boundary of unit 8 in order to maintain a fully functional travel corridor, particularly for deer, even in the event of some withthrow on the leeward edge of unit 8. Though there are no naturally occurring extensive timbered corridors on the interior of the island between the two old growth units in this area, these measures will help maintain the best available. The physical road closure and Forest Road closure order that I have called for in this decision will also help mitigate impacts to the corridor after completion of timber sale harvest.

8) Based on input from the Alaska Department of Fish and Game, I have increased the retention that will be left within the lower one-third of units 5 and 6 to 75% of the trees 9 inches or greater in size. The lower portions of these two units contained the only modeled high value deer habitat affected by harvest in the project area. This change will minimize potential impacts to the high value deer winter habitat within the project area. In addition, units 6 and 8 have been widely spaced in order to mitigate for potential windthrow along the boundary of unit 8.

9) The primary recreational use of the island is deer hunting. This will remain the case under the Selected Alternative. Some increased availability of access to the Vial and Upper Middle Meter Bight Creek areas for deer hunting will be allowed with the modification of the road closure Option B as described in the decision. My decision to use berms to close these two roads rather than gates and to allow ATV use is based on several factors. Subsistence hearing comments from local users favored allowing at least this much access for the reasons stated in Chapter 3 of the Final EIS. After consultation with the Alaska Department of Fish and Game, I felt that this accommodation on the Vial and Upper Middle Meter Bight

Creek road systems was reasonable. This decision coupled with the decision to fully close the Nesbitt Ridge road which accesses more sensitive habitat, seems a reasoned balance that will accommodate subsistence and recreational hunting concerns while balancing longer term security needs for deer. Berms are also likely to be a more successful long term closure option in this case as compared to more vulnerable gates.

Potential negative effects to wildlife from improved access are also mitigated, in the Nesbitt Ridge area, by issuing a Forest Order closing motorized vehicle access as described above. Though the road access created in this area could be a concern for summer and fall deer security in the area, I believe that the measures I have incorporated in Alternative 5 will be effective in mitigating this issue.

Impacts to deer are further mitigated in this decision by the changes made to units 5 and 6 to leave more trees in the lower portions of the units which contain the only modeled high value deer habitat in any of the harvest units. Alternative 5 also harvests the least acreage of any of the action alternatives in the Nesbitt Ridge area. To this extent, Alternative 5 approaches harvest in the project area more slowly than the other action alternatives. This should have benefits to deer and is a more conservative approach related to acceleration of windthrow which is somewhat interrelated to long term wildlife effects.

10) The Selected Alternative allows reconstruction of the Roosevelt Harbor equipment off-loading bulkhead, which is currently in need of repair. The Deep Bay and St. John LTF dive monitoring results are well within permit thresholds, thereby alleviating concern for bark accumulation associated with log-watering.

How Significant Issues are Addressed

In making my decision, I considered five major issues identified during the planning process. In the following summary, I disclose how the Selected Alternative addresses each of the significant issues. Table 2-5 and Chapter 3 of the Final EIS supplement the following discussion and provide a comparison of the alternatives.

Issue 1: Project Economics

The Selected Alternative uses even-aged management through clearcutting with reserves as the method to harvest timber from approximately 906 acres of National Forest System lands. Selected harvest units will retain at least 10% of the existing trees per acre over 9 inches DBH within the stand.

The Selected Alternative would provide about 19.1 MMBF of timber (from stand exam based estimates), which would contribute to the Forest Service's attempt to seek to meet market demand while being consistent with the Tongass Forest Plan and the Standards and Guidelines for all resources. Timber from this sale is needed as a

component of the timber sale schedule to provide timber to industry in an even flow over the ten-year planning cycle. The timber volume is also necessary as a substantial component of the timber sale program to be offered in fiscal year 2000. The harvest economic analysis contained in the Final EIS resulted in a stumpage value range of $ - 21.25/MBF at low market conditions, to $134.47/MBF at high market conditions for the Selected Alternative. Stumpage values actually received on timber sales are highly variable and are highly subject to market conditions at the time the sale is offered.

The combination of relatively easy road building and the ability to uphill yard most of the units lends itself to a cable yarding operation. Timber sale economics can be enhanced further by leaving cull and low value trees as the 10 percent retention. These types of trees are often the highest value for wildlife and will provide this legacy for the next rotation. From my review of the Final EIS, I believe that an economic sale offering can be prepared under the Selected Alternative in most market conditions.

The Selected Alternative will stimulate regeneration and will lead to rapid growth on the regenerating trees in the stand consistent with Forest Plan direction for this land use designation. Additional rationale for my decision in relation to this issue is found in "Reasons for the Decision" above at item 4.

Issue 2: Road Access Management

This issue addresses concerns for road access management within the Skipping Cow Project Area. The Selected Alternative will build 10.7 miles of specified road and 3.9 miles of temporary road within the project area.

At the subsistence hearing held in Wrangell, Alaska, all who were in attendance wanted to see all new roads accessible for at least ATV use after the timber sale was completed. The Alaska Department of Fish and Game expressed concerns about post sale impacts of the Nesbitt Ridge road because it could impact important summer and fall deer habitation. The Selected Alternative will close the Nesbitt Ridge Road to all motorized vehicles by removing drainage structures, placing a barrier berm at the junction of Roads 6594 and 52033, and by a Forest Order prohibiting motorized use of the road. The remaining roads within the project area will have closures installed that will allow post sale ATV use of these roads. These roads would be physically barred (likely with a large berm) to eliminate conventional vehicle traffic after timber harvest, but would not be physically closed in such a way as to eliminate ATV use. As roads close over time, because of alder growing on the road surface, this approach will lead to no net increase in drivable roads on Zarembo Island. Additional rationale for my decision in regard to this issue is found in "Reasons for the Decision" above at items 3, 7 and 9 and in the Final EIS in Chapter 3.

Issue 3: Wildlife Habitat

This issue reflects the concern for potential reduction in wildlife-habitat capabilities for key Management Indicator Species found in the Skipping Cow Project Area. The Wildlife section in Chapter Three of the Final EIS discusses these concerns in detail. The Selected Alternative has the second least effect of any of the action alternatives on wildlife habitat and species conservation in the Skipping Cow Project Area. The changes I have made to the Selected Alternative will help further reduce wildlife impacts as discussed above. Retention of the existing travel corridor connecting the two medium old-growth reserves largely maintains what limited forested connectivity naturally exists within the interior of the project area for Old Growth dependent species. Retention of 75% of the trees per acre in the lower one-third of harvest units 5 and 6 responds to concerns for maintaining high value deer winter habitat within the project area. The road management strategy I have selected will further reduce potential impacts to security and travel corridors for deer in the Nesbitt Ridge area.

More of the leave trees will be placed on the lower one-third of the slope in Units 8, 18, 20, 21, and 25. The windthrow patterns and existing stand characteristics indicate that this portion of the slope tends to be less exposed to large-scale windthrow within these units.

Five large trees per acre in Units 13, 14, & 15 will be left as part of the prescribed 10% or more retention trees in these units to mitigate harvest impacts and provide a component of large trees in these units as potential useful future habitat for murrelets.

Open road density in all alternatives is well below the $0.7 mi/mi^2$ concern level for wolf impacts stated in the Forest Plan ROD 1999. The open road density in the Project Area following implementation of the Selected Alternative will be $0.41 mi/mi^2$.

Harvest units will be managed on a 200 year rotation. Alternative 5 harvests on the least total acres in the project area and harvests on the least number of acres in the Nesbitt Ridge area. The even aged harvest used in the Nesbitt Ridge area compared to partial cut harvest is a reasoned balance that responds to the fact that the upper 2/3rd of the slope is exposed to large scale windthrow and such windthrow has occurred in the past. Though Alternative 4, for example, would partial cut on the Nesbitt Ridge area, I believe it is somewhat more likely to accelerate large scale windthrow than the more conservative approach taken by Alternative 5.

Timing restrictions on timber sale operations are included in this decision to help mitigate potential effects to nesting marbled murrelets and sandhill cranes. (see Final EIS Chapter 3 and Appendix B-1)

Based on my review of the Final EIS, the impact of any of the alternatives developed would be acceptable in relation to biodiversity and wildlife species impacts with Alternative 5, as I have modified it, best balancing the key issues. Additional rationale related to this issue are found in my responses in the "Reasons for the Decision" above at items l, 3, 7, 8, and 9.

Issue 4: Subsistence

This issue reflects public concern for the availability of wildlife, marine life, and plants for customary and traditional use by rural Alaska residents. Chapter 3 of the Final EIS evaluates the potential site-specific effects on subsistence that could result from implementing any of the proposed timber harvest and associated road construction alternatives.

I have determined that there is not a significant possibility of a significant restriction of subsistence use of deer, wolves or other resources in the project area. The effects of the Selected Alternative on the subsistence use of these resources are minimal.

This issue is intertwined with the other issues above, and discussed throughout the Final EIS. Balancing road construction concerns (cost, risk to soil, and water,) and opportunities (possible improved economics, future management), new access opportunities (hunting, recreation) and impacts (subsistence competition, loss of unroaded recreation, impacts to wildlife) is challenging and unique to each project. The Selected Alternative builds 10.7 miles of specified road and 3.9 miles of temporary road.

Given the unique combination of features specific to the project area discussed in the Final EIS, I believe the best choice for this sale is Alternative 5 with road management as described in this decision. This decision responds both to Alaska Department of Fish and Game concerns for deer security, to subsistence testimony seeking at least limited access to new harvest units based on past hunter use and success in such areas, and to input received from the Wrangell Cooperative. Additional rationale for my decision in relation to this issue is found above in "Reasons for the Decision" at items 3, 7, 8, and 9.

Issue 5: Wind Ecology

This issue reflects the concern that the project area is exposed to high winds and may be vulnerable to large scale blowdown. Much of the forest in the Nesbitt and Vial Creek area originated after a windstorm blew down the existing forest approximately 250 years ago. The Selected Alternative was designed to reduce the likelihood of large-scale windthrow caused from harvesting.

The current stage of development of most of the stands in the Nesbitt and Vial Creek drainages is the Understory Reinitiation Stage. These stands developed after a stand replacing windstorm disturbance that occurred approximately 250 years ago.

Alternative 5, as modified, strikes a balance that is realistic about the potential for windthrow in the area while weighing other resource and economic considerations with this concern. Additional rationale for my decision in relation to this issue is found above in "Reasons for the Decision" at item 6.

Public Involvement

Public involvement has been instrumental in the identification and clarification of issues for this project. This has been helpful in the formulation of alternatives and has assisted me in making a more informed decision for the Skipping Cow project. Public meetings, *Federal Register* notices, newspaper and radio releases, open houses, the Stikine Area Project Schedule, and group and individual meetings were some of the tools used to solicit input for this project.

Preliminary Scoping Letter: In December of 1997, a preliminary scoping letter was sent to everyone on the Stikine Area Project Schedule to identify possible issues for a possible timber sale on the south central part of Zarembo Island.

Notice of Intent: A Notice of Intent to Prepare an Environmental Impact Statement was published in the *Federal Register* on July 8, 1998, when it was decided that an EIS was to be completed for the project.

Public Comment received for the Draft EIS: Availability of the Draft EIS was announced in the Federal Register on August 6, 1999, with a deadline for public comments listed as September 30, 1999. The letters received during the comment period were responded to in the Final EIS (Appendix G).

Open Houses: Three open house public meetings were held in Wrangell during the scoping period to solicit comments.

Subsistence Hearings: A Subsistence hearing on the Draft EIS was held in Wrangell, Alaska, on September 9th, 1999 at the Wrangell Public Safety Building. An Open House to describe the analysis process and to answer public questions was held in conjunction with the subsistence hearing. Public comment on the Draft EIS was also accepted at that time. The date, time, and location were publicized in the local media.

Wrangell Cooperative: The Wrangell Cooperative Association, the local tribal government, was consulted about any potential impacts of concern to the Cooperative during the development of alternatives and mitigations to this environmental impact statement and no significant concerns were raised.

Open House: A meeting on the topic of Road Access Management was held on January 5, 2000 to inform the public about the preferred road option being considered after consultation with the Alaska Department of Fish and Game for the Skipping Cow Project Area on Zarembo Island. The date, time, and location were publicized

in the local media, as well as phone calls made to those who attended the Subsistence Hearing, but no comments were received.

Analysis and Incorporation of Public Comments: Public comments and subsistence comments have been analyzed and incorporated into the Final EIS. For an analysis of public comment and the Forest Service response to public comment, see Appendix G of the Final EIS.

The Final EIS has been filed with the Environmental Protection Agency and is available to the public.

Coordination With Other Agencies

From the time scoping was initiated, meetings and site visits with all interested State and Federal agencies have occurred. Issues were discussed and information was exchanged. Alaska Department of Fish & Game, Alaska Department of Environmental Coordination, and U.S. Fish and Wildlife Service personnel visited the project area during the Draft EIS development.

Coordination meetings were held with the State of Alaska including the Department of Fish and Game and the Department of Environmental Conservation. The Alaska Coastal Management Plan (ACMP) consistency review process was initiated upon publication of the Draft EIS through the offices of the Alaska Division of Governmental Coordination. A field review in the project area was held with the Alaska Department of Fish and Game between the Draft and Final EIS to look at mitigations for wildlife impacts.

A Biological Assessment was prepared and sent to the U.S. Fish and Wildlife Service and to the National Marine Fisheries Service as part of the Section 7 consultation under the Endangered Species Act.

The Final EIS identifies the agencies that were informed of and/or involved in the planning process (see *List of Agencies, Organizations, and Individuals Sent Copies of this Statement in Chapter 4 of the Final EIS*).

Alternatives Considered in Detail

Five alternatives were considered in detail in the Final EIS. Each action alternative is consistent with the Tongass Forest Plan and the 1999 Forest Plan Revision Record of Decision. The analysis of each action alternative displays (1) the areas considered for harvest, (2) the location of any proposed roads for access, and (3) the type of logging systems to be used. For a complete description of these alternatives refer to Chapter 2 of the Final EIS. The alternatives as developed in the Final EIS are:

Alternative 1 - This No-Action Alternative represents the existing conditions in the Project Area, and serves as the baseline against which the effects of the other

alternatives are measured. There would be no new resource outputs associated with this alternative. No road construction or timber harvest would occur. Additional receipts to the State of Alaska would be foregone, existing timber-related jobs would not be sustained, and no new opportunities for timber-related jobs would be created. There would be no changes to scenery, recreation, subsistence, wildlife or fisheries resources.

Alternative 2 - This alternative was designed to respond to the issue of wildlife habitat values, by retaining approximately 20 to 30 percent of the trees over 9 inches diameter at breast height (DBH) within all of the units. This alternative would harvest approximately 22.1 MMBF of timber from approximately 1,131 acres. This alternative would harvest 167 acres by helicopter yarding. The remainder of the acres would be yarded using cable. The resulting stands would be managed as two-aged stands in order to provide structure within the stands for wildlife. The retention would be left along backlines, in clumps, and/or scattered throughout the units. Approximately 9.6 miles of specified and 3.5 miles of temporary road would be constructed within the project area.

Alternative 3 - This alternative was the Proposed Action presented during public scoping. The theme of this alternative responded to the issue of timber economics by maximizing clearcutting and the use of cable yarding. This alternative would harvest approximately 24.4 MMBF of timber from approximately 1,110 acres. The prescription would leave 10 percent of the trees over 9 inches DBH within all units. The resulting stands from this alternative would be managed as even-aged. This alternative would require construction of about 11.8 miles of specified and 4.4 miles of temporary road. All units in this alternative would be accessible by road.

Alternative 4 – This alternative was designed to respond to the issue that road building and clearcutting may have an adverse effect on deer habitat and access for non-road subsistence hunting within the Nesbitt drainage. This alternative would manage the harvest units as follows: 449 acres as even-aged stands, 296 acres as two-aged stands, and 1,009 acres as uneven-aged stands. Retention would consist of the following percent of the trees per acre over 9 inches DBH left within units: even-aged stands would have 10, two-aged stands 20-30, and the uneven-aged stands would have 75. This alternative would harvest approximately 21.6 MMBF of timber from approximately 1,754 acres. This alternative would harvest 1,372 acres by helicopter yarding and approximately 381 acres by cable yarding. Approximately 4.2 miles of specified and 1.4 miles of temporary road would be constructed within the project area.

Alternative 5 – The theme of this alternative responded to the issue of wind ecology. A high percentage of the project area has blown down in the past with one catastrophic event. This alternative selected units in the most windthrow prone portion of the project area to reduce the amount of accelerated blowdown. This approach would lend itself to future harvest by advancing into the wind and reducing the amount of harvest-created edge exposed to the prevailing wind at any one time. This alternative would harvest approximately 19.1 MMBF of timber using cable yarding from approximately 906 acres. The prescription would leave at least 10

percent of the trees over 9 inches DBH within all units with 75% the trees left on the lower one-third of units 5 and 6. The resulting stands from this alternative would be managed as even-aged. This alternative would require construction of about 10.7 miles of specified and 3.9 miles of temporary road. All units in this alternative would be accessible by road.

Environmentally Preferred Alternative

Based on a comparison of the alternatives and the discussion contained within Chapter 3 of the Final EIS, Alternative 1, the No Action Alternative, would cause the least environmental disturbance and is therefore the environmentally preferred alternative of all the alternatives studied in detail. Of the action alternatives, Alternative 5 is the environmentally preferred alternative.

Alternatives Not Considered in Detail

Large Clearcut Alternative – This alternative would have responded to the concern about windthrow in the Project Area by mimicking a massive windthrow event. This alternative proposed harvesting much of the area west of Nesbitt Creek and some of the upper portions of the Vial Creek drainage in 2 to 3 very large harvest units. This would reduce the amount of edge subject to windthrow. This alternative was eliminated because of potential adverse effects on many resources. This alternative would have needed Regional Forester approval for harvesting units over 100 acres in size that were prescribed to be clearcut.

Helicopter-only Alternative – This alternative would emphasize wildlife habitat protection, especially security habitat for deer by not building any additional roads within the project area. This alternative would not have provided increased access for future timber sales harvest by either cable or helicopter. Expanding the road network at this time was carried forward in order to enhance the economic viability of this sale and future timber sales consistent with Forest Plan direction for this land use designation. By building road this entry, the road construction costs would be lower with future sales, and it would allow the Forest Service to better meet the Timber LUD goals for this sale and future sales. A helicopter only entry in this area would not allow for progress toward the desired future condition for this LUD because much of the project area would be too far to yard logs by helicopter, requiring, for much of the project area, flight distances of several miles. Given these problems, and the fact impacts from road building can be mitigated as described in the environmental impact statement, this alternative approach was not analyzed in detail.

Old Growth Reserve Alternative – This alternative would have accessed the upper Middle Meter Bight drainage by extending Road 52004 from the Round Point Medium Old Growth Reserve. In the early planning stages of this project, it was believed that this was the only way to provide road access into the upper Middle Meter Bight and Vial Creek drainages. Approximately half the volume from this sale would have been hauled through the Old Growth Reserve if this alternative were

carried forward. This alternative was eliminated after an alternate route was identified during field reconnaissance that did not require road building or hauling through the Old Growth Reserve.

Planning Record

The planning record for this project includes the Draft EIS, Final EIS, Forest Plan, Alaska Regional Guide, material incorporated by reference, and all materials produced during the environmental analysis of this project. The planning record is available for review at the Wrangell Ranger District.

Mitigation

Mitigation measures are prescribed to avoid, reduce, minimize or eliminate the adverse effects of actions. These measures were applied in the development of the project alternatives, including the Selected Alternative, and in the design of the harvest units and road corridors. The *Mitigation Measures* section of Chapter 2 and Appendix D of the Final EIS discusses mitigation measures for all alternatives.

Mitigation measures applicable to the Selected Alternative include measures contained in the Standards and Guidelines of the Forest Plan, Alaska Regional Guide, and applicable Forest Service Manuals and Handbooks. The Final EIS includes site-specific mitigation measures described in Chapter 2, Road Cards (Appendix C), Mitigation Measures (Appendix D), and Unit Cards in the Record of Decision (Appendix 1). These measures are adopted as part of this decision and will be implemented. Measures to avoid or minimize adverse environmental effects of the project have been incorporated into the Selected Alternative.

Monitoring

A monitoring program is the process by which the Forest Service can evaluate whether the resource management objectives of the final environmental documents have been implemented as specified and whether the steps identified for mitigating the environmental effects were effective. Monitoring requirements are specified in Appendix E of the Final EIS. These monitoring items are adopted as part of this decision and will be implemented.

Each monitoring item describes the objective of the monitoring, what will be done, how it will be done, and the approximate cost of the monitoring. Monitoring activities may reveal results that deviate from planned effects, in which case corrective actions are prescribed. The Wrangell Ranger District is responsible for ensuring that project implementation, mitigation, monitoring, and enforcement are accomplished as specified in the Final EIS.

Findings Required By Law

National Forest Management Act

The National Forest Management Act (NFMA) requires specific determinations in this Record of Decision: consistency with existing Forest Plans and Regional Guides, a determination of clearcutting as the optimal method of harvesting, and specific authorizations of created openings over 100 acres in size. Specific information and rationale for used to develop unit prescriptions is shown on unit card, in the sale record, in the Final EIS at Chapter 3, and is summarized in this Record of Decision.

Tongass Forest Plan and Alaska Regional Guide - This decision is consistent with the Alaska Regional Guide and the Tongass Forest Plan. I have reviewed the management direction, Standards and Guidelines, and the schedule of activities for the VCU included in the Selected Alternative, and find the Selected Alternative to be consistent with these elements. The activities authorized in this decision are consistent with the Standards and Guidelines and Management Prescriptions of the Forest Plan.

Clearcutting as the Optimal Method of Harvesting – The Forest Plan (pg. 4-96 to 4-97) gives guidance when to use even-aged management. Clearcutting (an even-aged method) is used in Alaska's western hemlock-Sitka spruce forests when one of the following situations is needed: excellent regeneration of desire species, effective dwarf mistletoe control, where there is a high risk of windthrow, viable harvest economics, and/or compatibility with the use of standard logging systems. Harvest units in the Selected Alternative have a high risk of windthrow. Clearcutting meets the objective of maintaining fast-growing, mistletoe-free stands of mixed species and is the optimum method of harvesting. Also, the most important reason is it will reduce the risk of blowdown in residual stands. The chance of blowdown along cutting boundaries is increased but can be reduced through proper design of cutting boundaries. Specific information and rationale for use of this prescription is shown on units cards attached with this Record of Decision, in the project planning record, in the Final EIS in Chapter 3, and the rationale is summarized in this record of Decision. Where used this prescription has been deemed optimal related to site-specific considerations as described above.

Harvest Openings Over 100 Acres in Size - There are no harvest openings over 100 acres proposed for this project.

Tongass Timber Reform Act (TTRA)

Harvest units were designed and located to maintain a minimum 100-foot buffer zone for all Class I streams and Class II streams that flow directly into Class I streams as required in Section 103 of the TTRA. The actual widths of these buffer strips will often be greater than the 100-foot minimum. The design and implementation direction for the Selected Alternative incorporate Best Management Practices (BMPs) for the protection of all streams.

Endangered Species Act

Actions authorized in the Selected Alternative are not anticipated to have a direct, indirect, or cumulative effect on any threatened or endangered species in the Skipping Cow Project Area. The U.S. Fish and Wildlife Service and the National Marine Fisheries Service have concurred that the actions described within the proposed project are not likely to adversely affect threatened and endangered species. A complete biological assessment is included in the planning record for this project. I have determined that this action will not have any adverse impacts on any threatened or endangered species.

Bald Eagle Protection Act

A Memorandum of Understanding (MOU) between the Forest Service and the U.S. Fish and Wildlife Service to facilitate compliance with the Bald Eagle Protection Act restricts management activities within 330 feet of an eagle nest site. The Selected Alternative is not anticipated to have a significant direct, indirect, or cumulative effect on any bald eagle habitat.

Clean Water Act

The design of harvest units for the Selected Alternative were guided by Standards, Guidelines and direction contained in the Forest Plan, Alaska Regional Guide, and applicable Forest Service manuals and handbooks. The Unit Cards (Appendix B) and Road Cards (Appendix C) contain specific details on practices prescribed to prevent or reduce non-point sediment sources. Reasonable implementation with site specific application and monitoring of approved BMPs is expected to comply with applicable State Water Quality Standards Regulations. These regulations provide for variances from anti-degradation requirements and water quality criteria. The timber harvest operators will be responsible for compliance, including obtaining any variance required by the State, and will be monitored for compliance by the Forest Service.

Essential Fish Habitat

The Skipping Cow Timber Sale is unlikely to adversely affect Essential Fish Habitat for the following reasons:

1. proposed new roads do not cross Class I streams
2. all harvest units adjacent to Class I streams employ no-harvest buffers at least 100 feet wide and generally wider according to Forest Plan Standards and Guidelines
3. proposed road and facility reconditioning will improve erosion and sediment control in the vicinity of Deep Bay and Roosevelt Harbor.

The Best Management Practices described in the unit cards provide assurance of water quality and aquatic habitat protection for all freshwater streams and marine waters affected by the project. Based on the information presented in the Final EIS, I have determined that the Selected Alternative is unlikely to adversely affect essential fish habitat.

National Historic Preservation Act

We conducted heritage resource surveys of various intensities in the Project Area. The State Historic Preservation Officer has been consulted, and the project complies with the provisions of 36 CFR part 800. I have determined that there will be no significant effects on cultural resources.

Federal Cave Resource Protection Act of 1988

No cave resources have been documented in the Project Area and no caves were discovered during field work done for this analysis. Therefore the Selected Alternative will not have a direct, indirect, or cumulative effect on any significant cave in the Skipping Cow Project Area.

ANILCA Section 810, Subsistence Evaluation and Findings

A subsistence evaluation was conducted for the five alternatives considered in detail, in accordance with ANILCA Section 810. The full analysis is located in the planning file for this project and summarized in Chapter 3 of the Final EIS. The evaluations in the Subsistence Report on abundance, distribution, access and competition for harvested resources in the project area indicate that there is no significant possibility of a significant restriction on subsistence uses of wildlife, fish, and shellfish, marine mammals, other foods, and timber resources as a result of this sale.

Coastal Zone Management Act

The Coastal Zone Management Act of 1972 (CZMA), while specifically excluding Federal lands from the coastal zone, requires that a Federal agency's activities be consistent with the enforceable standards of a state's coastal management program to the maximum extent practicable when the agency's activities affect the coastal zone.

The enforceable standards for timber harvest activities are found in the State Forest Practices Act. The standards and guidelines for timber management activities in the Skipping Cow Project Area meet or exceed the standards in the State Forest Practices Act.

I have determined that the proposed activities in the Selected Alternative are consistent with the Alaska Coastal Management Program to the maximum extent practicable. The State of Alaska has concurred with my determination.

Consumers, Civil Rights, Minorities and Women

No negative impacts to the civil rights of individuals or groups, including minorities and women are anticipated to be associated with this project. Additional information can be found in the Forest Plan Revision Final EIS Chapter 3 and Appendix H, as well as Chapter 3 of the Skipping Cow Final EIS.

Executive Orders

EO 11988 (Floodplains) - Executive Order 11988 directs Federal agencies to take action to avoid, to the extent practicable, the long and short-term adverse impacts associated with the occupancy and modification of floodplains. The Selected

Alternative does not modify any floodplains. No roads will be constructed across floodplains, and no floodplains will be harvested.

EO 11990 (Wetlands) - Executive Order 11990 requires Federal agencies to avoid, to the extent practicable, the long and short-term adverse impacts associated with the destruction or modification of wetlands. The Selected Alternative avoids most identified wetlands; however, many small wetlands or muskegs occur as inclusions within forested areas. These areas may be altered by timber harvest or road construction. Techniques and practices required by the Forest Service serve to maintain the wetland attributes including values and functions. It is estimated there will be only minimal loss of wetlands with any of the alternatives. Soil moisture regimes and vegetation on some wetlands may be altered in some harvest units; however, these altered acres would still be classified as wetlands and function as wetlands in the ecosystem.

Because wetlands are found throughout the project area, it is not feasible to avoid all wetland areas. However, there are no development activities planned on the more biologically significant wetlands.

EO 12898 (Environmental Justice) - Executive Order 12898 directs Federal agencies to identify and address the issue of environmental justice, i.e. adverse human health and environmental effects of agency programs that disproportionately impact minority and low-income populations. The order specifically directs agencies to consider patterns of subsistence hunting and fishing when an agency action may affect fish or wildlife. I have determined that implementation of the Selected Alternative will not cause adverse health or environmental effects that disproportionately impact minority and low-income populations.

EO 12962 (Recreational Fisheries) - Executive Order 12962 directs Federal agencies to conserve, restore and enhance aquatic systems to provide for increased recreational fishing opportunities nationwide. Section 1 of the Executive Order is most pertinent to the proposed activity. Section 1 directs Federal agencies to evaluate effects on aquatic ecosystems and recreational fisheries, develop and encourage partnerships, promote restoration, provide access, and promote awareness of opportunities for recreational fishery resources.

The effects of this project have been evaluated throughout the Final EIS, including effects to freshwater and marine resources. Partnerships are continuing to be used to leverage Federal project funds to address water quality concerns in areas of the Tongass National Forest, although none have been proposed for recreational fisheries in conjunction with this project.

The Selected Alternative attempts to minimize the effects on aquatic systems through project design, application of Forest Plan Standards and Guidelines, BMPs and site-specific mitigation measures. Recreational fishing opportunities will remain essentially the same because aquatic habitats are protected through implementation of BMPs and riparian buffers, and because the isolated road system, far from the nearest

town, is unlikely to result in increased opportunities. I have determined that there will be no significant effect to recreational fisheries.

Federal and State Permits

Federal and State permits necessary to implement the authorized activities are listed in Chapter 1 of the Final EIS.

Implementation Process

Implementation of this decision may occur no sooner than 50 days following publication of the legal notice of the decision in the *Petersburg Pilot*, published in Petersburg, Alaska. This timber sale is planned to be offered in the fall of 2000.

This project will be implemented in accordance with Forest Service Manual and Handbook direction for Timber Sale Project Implementation in FSM 2431.3 and FSH 2409.24. This direction provides a bridge between project planning and implementation and will ensure execution of the actions, environmental standards, and mitigation approved by this decision, and compliance with TTRA and other laws. All applicable Best Management Practices (BMPs) will be applied to the Selected Alternative.

Implementation of all activities authorized by this Record of Decision will be monitored to ensure that they are carried out as planned and described in the Final EIS.

Appendix 1 of this Record of Decision contains the Selected Alternative harvest unit design cards. These cards are an integral part of this decision because they document the specific resource concerns, management objectives, and mitigation measures to govern the layout of the harvest units. These cards will be used during the implementation process to assure that all aspects of the project are implemented within applicable standards and guidelines and that resource impacts will not be greater than those described in the Final EIS. Similar cards will be used to document any changes to the planned layout as the actual layout and harvest of the units occurs with project implementation.

The implementation record for this project will display:

1. each harvest unit as actually implemented,
2. any proposed changes to the design, location, standards and guidelines, or other mitigation measures for the project, and
3. authorization of the proposed changes.

Procedure for Changes During Implementation

Proposed changes to the authorized project actions will be subject to the requirements of the National Environmental Policy Act (NEPA), the National Forest Management

Act of 1976 (NFMA), Section 810 of the Alaska National Interest Lands Conservation Act, the Tongass Timber Reform Act (TTRA), the Coastal Zone Management Act (CZMA), and other laws concerning such changes.

In determining whether and what kind of NEPA action is required, the Assistant Forest Supervisor will consider the criteria for whether to supplement an existing Environmental Impact Statement (EIS) in 40 CFR 1502.9(c), and FSH 1909.15, sec. 18, and in particular, whether the proposed change is a substantial change to the Selected Alternative as planned and already approved, and whether the change is relevant to environmental concerns. Connected or interrelated proposed changes regarding particular areas of specific activities will be considered together in making this determination. The cumulative impacts of these changes will also be considered.

The intent of field verification is to confirm inventory data and to determine the feasibility and general design and location of a unit or road, not to locate final boundaries or road locations. Minor changes are expected during implementation to better meet on-site resource management and protection objectives. Minor adjustments to unit boundaries are also likely during final layout for the purpose of improving logging system efficiency. This will usually entail adjusting the boundary to coincide with logical logging setting boundaries. Many of these minor changes will not present sufficient potential impacts to require any specific documentation or other action to comply with applicable laws. Some minor changes may still require appropriate analysis and documentation to comply with FSH 1909.15, sec. 18.

Right to Appeal

This decision is subject to administrative appeal. Organizations or members of the general public may appeal this decision according to Title 36 Code of Federal Regulations (CFR) part 215. The appeal must be filed within 45 days of the date that legal notification of this decision is published in the *Petersburg Pilot*, the official newspaper of record. The written Notice of Appeal must be filed with:

Regional Forester
Forest Service
U.S. Department of Agriculture
P.O. Box 21628
Juneau, AK 99802-1628

It is the responsibility of those who appeal a decision to provide the Regional Forester sufficient written evidence and rationale to show why the decision by the Assistant Forest Supervisor should be changed or reversed. This written Notice of Appeal must:

1. State that the document is a Notice of Appeal filed pursuant to 36 CFR Part 215;
2. List the name, address, and, if possible, the telephone number of the appellant;

3. Identify the decision document by title and subject, date of the decision, and name and title of the Responsible Official;
4. Identify the specific change(s) in the decision that the appellant seeks or portion of the decision to which the appellant objects;
5. State how the Responsible Official's decision fails to consider comments previously provided, either before or during the comment period specified in 36 CFR 215.6 and, if applicable, how the appellant believes the decision violates law, regulation or policy.

For additional information concerning this decision, contact Jerry Jordan, Forest Service Interdisciplinary Team Leader, Wrangell Ranger District, P.O. Box 51, Wrangell, AK 99929, or call (907) 874-2323.

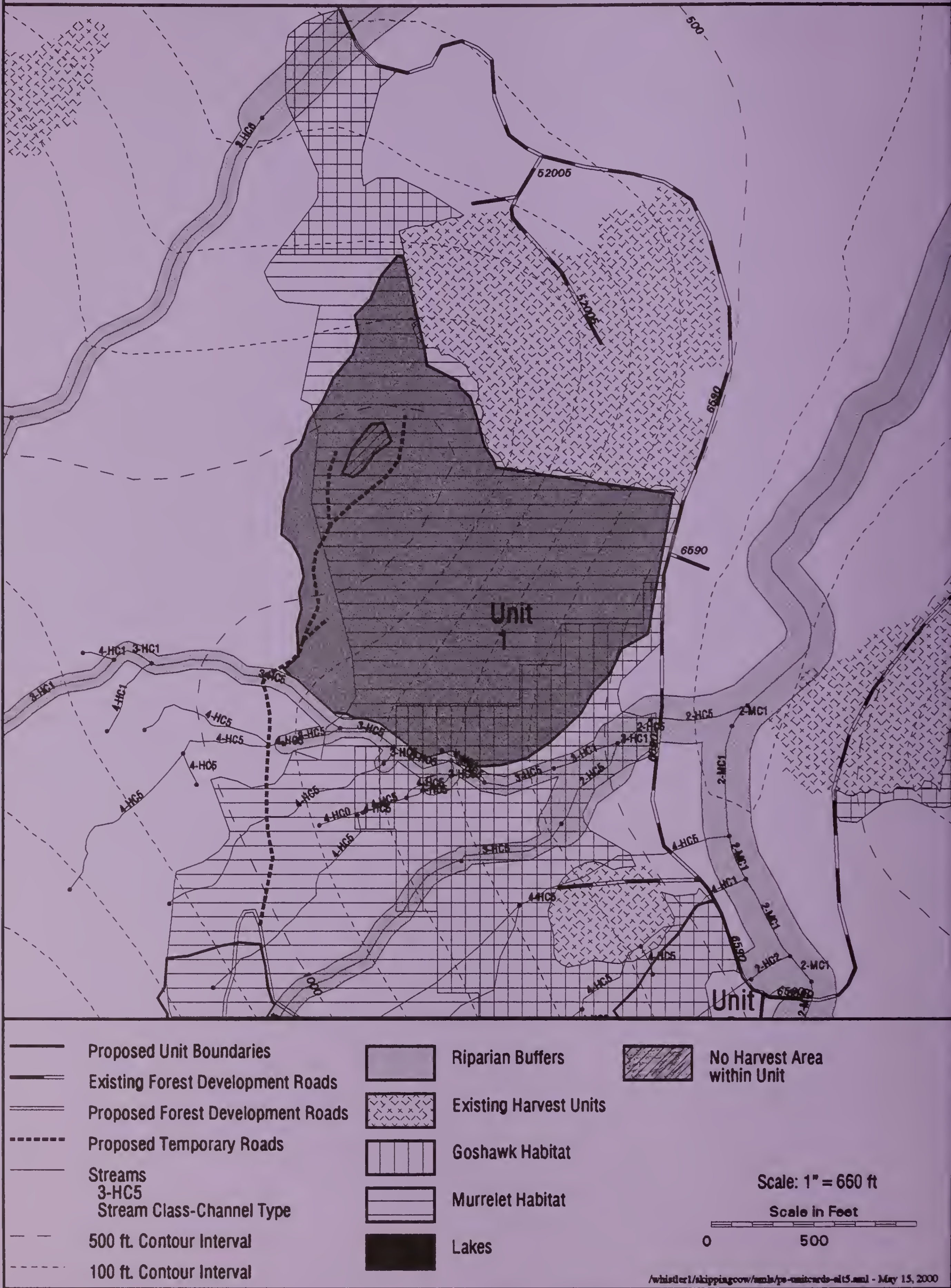
for Fred S Salinas 5-3-2000

CAROL J. JORGENSEN Date
Assistant Forest Supervisor
Tongass National Forest

Appendix to the Record of Decision

– Unit Cards for Selected Alternative

SKIPPING COW TIMBER HARVEST UNIT 1, ALT: 5 - 64 ACRES



Harvest Method: Cable (running skyline)
New road construction
Unit Size: 64 acres

Harvest Volume: 1,635 MBF

UNIT DEVELOPMENT

Stand Type:
Gap-phase blowdown area. Trees over 150 years old with pockets of younger aged trees.

Stand Management Objectives:
Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Release, possible planting, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Stream south of unit is Class III (HC5) flowing into Class II (HC5) Mustang Creek (tributary to North Meter Bight Creek).

Mitigation: Unit excludes sideslope adjacent to Class III stream and provides at least 100-foot no harvest buffer adjacent to Class II reach southeast of unit (BMPs 12.6, 12.6a). F1, F4

Soils/Wetlands

Concern: 2 acres of non-productive soils in the northwest corner of the unit.

Mitigation: Drop the non-productive acres from the unit.

Wildlife/TES Plants

Concern: There are approximately 12 acres of high probability goshawk nesting habitat (see map). There is a potential wildlife corridor along the stream which forms the southern border of the unit.

Mitigation: Implement Forest-wide standards and guidelines if a goshawk nest is found. Retain occasional large merchantable trees along the stream which forms the southern border of the unit. W1, W9

Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway route.

Mitigation: None needed.

Other Resources/Issues

Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 2, ALT: 5 - 77 ACRES

	Proposed Unit Boundaries		Riparian Buffers		No Harvest Area within Unit
	Existing Forest Development Roads		Existing Harvest Units		
	Proposed Forest Development Roads		Goshawk Habitat		
	Proposed Temporary Roads		Murrelet Habitat		
	Streams 3-HC5 Stream Class-Channel Type		Lakes		
	500 ft. Contour Interval				
	100 ft. Contour Interval				

Scale: 1" = 660 ft

Scale in Feet

0 500

/whistler1/skippingcow/amls/ps-unitcards-alt5.aml - May 15, 2000

Harvest Method: Cable (running skyline)
New road construction
Unit Size: 77 acres

Harvest Volume: 1,799 MBF

UNIT DEVELOPMENT

Stand Type:
Gap-phase blowdown area. Trees over 150 years old with pockets of younger aged trees.

Stand Management Objectives:
Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Release, possible planting, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Unit contains one Class III (HC6) and nine Class IV (HC5 or HC0) stream reaches flowing into Class II headwaters of Mustang Creek (tributary to North Meter Bight Creek).

Mitigation: Unit requires field review to exclude sideslopes adjacent to Class III stream. Unit provides for split yarding most Class IV streams by placing setting boundaries along stream courses. Provide full suspension whenever possible across Class IV streams; at least partial suspension is required (BMPs 12.6, 12.6a, 13.9, 13.16). F1, F4, F14

Soils/Wetlands

Concern:

Mitigation:

Wildlife/TES Plants

Concern:

Mitigation: W1, W9

Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway route.

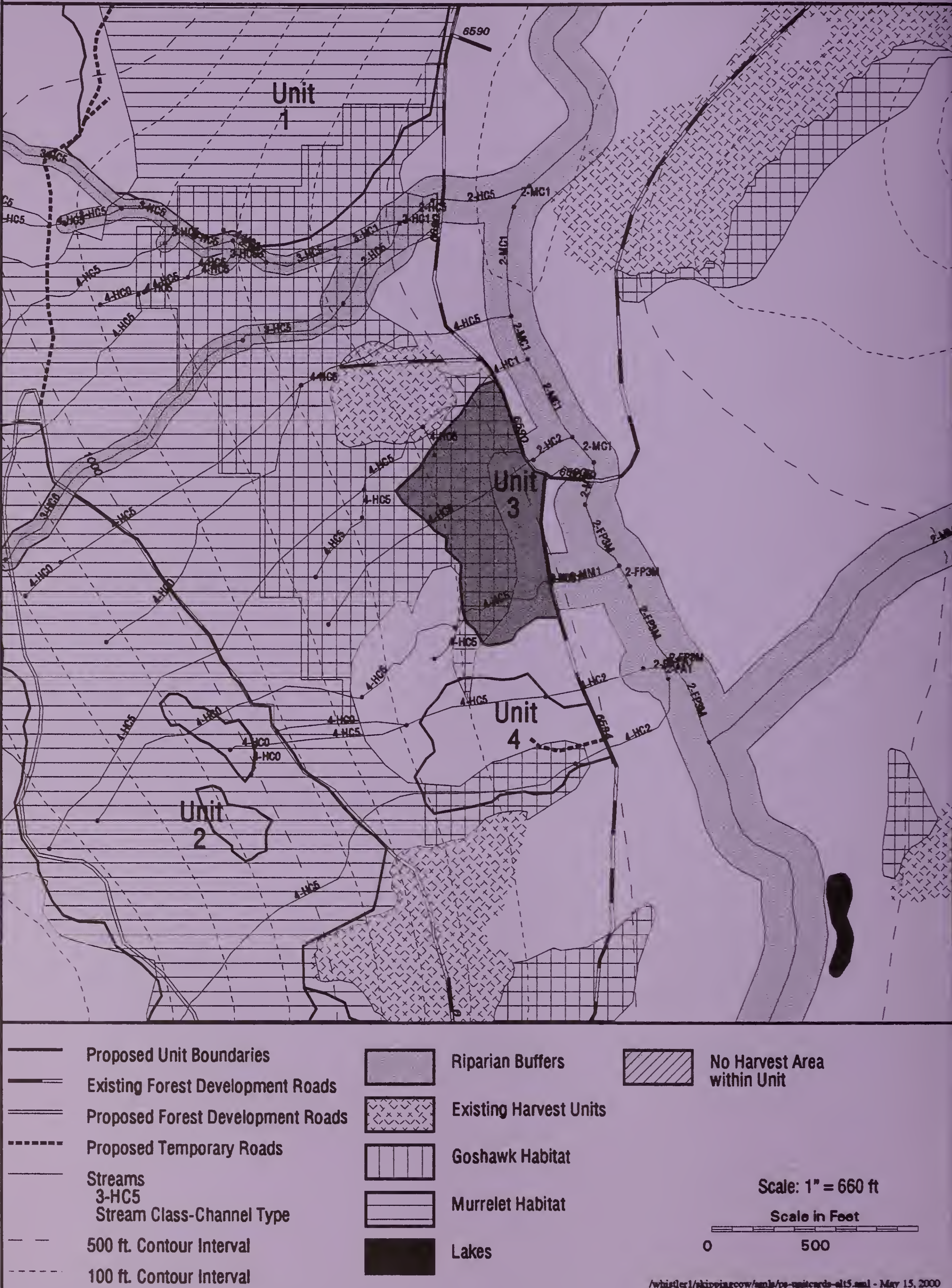
Mitigation: None needed.

Other Resources/Issues

Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 3, ALT: 5 - 11 ACRES



SKIPPING COW TIMBER SALE - UNIT CARD Unit 3 Alternative 5

Harvest Method: Cable (running skyline)
No new road construction
Unit Size: 11 acres

Harvest Volume: 141 MBF

UNIT DEVELOPMENT

Stand Type:
Gap-phase area. Trees over 150 years old with pockets of younger aged trees.

Stand Management Objectives:
Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Release, possible planting, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Class IV (HC5, HC1) streams within unit and north of unit flow directly into Class II (MM1, HC2) tributaries of Mustang Creek (tributary to North Meter Bight Creek).

Mitigation: Unit excludes Class II reaches which are limited to downstream side of Roads 6590 and 6594 (BMPs 12.6, 12.6a). Unit excludes north Class IV stream and provides for split yarding of at least one Class IV stream by placing setting boundaries along stream courses. Provide full suspension wherever possible across Class IV streams; at least partial suspension is required (BMPs 13.9, 13.16). F1

Soils/Wetlands

Concern:

Mitigation:

Wildlife/TES Plants

Concern: There are approximately 4 acres of high probability goshawk nesting habitat (see map).

Mitigation: Implement Forest-wide standards and guidelines if a goshawk nest is found. W1, W11

Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway route.

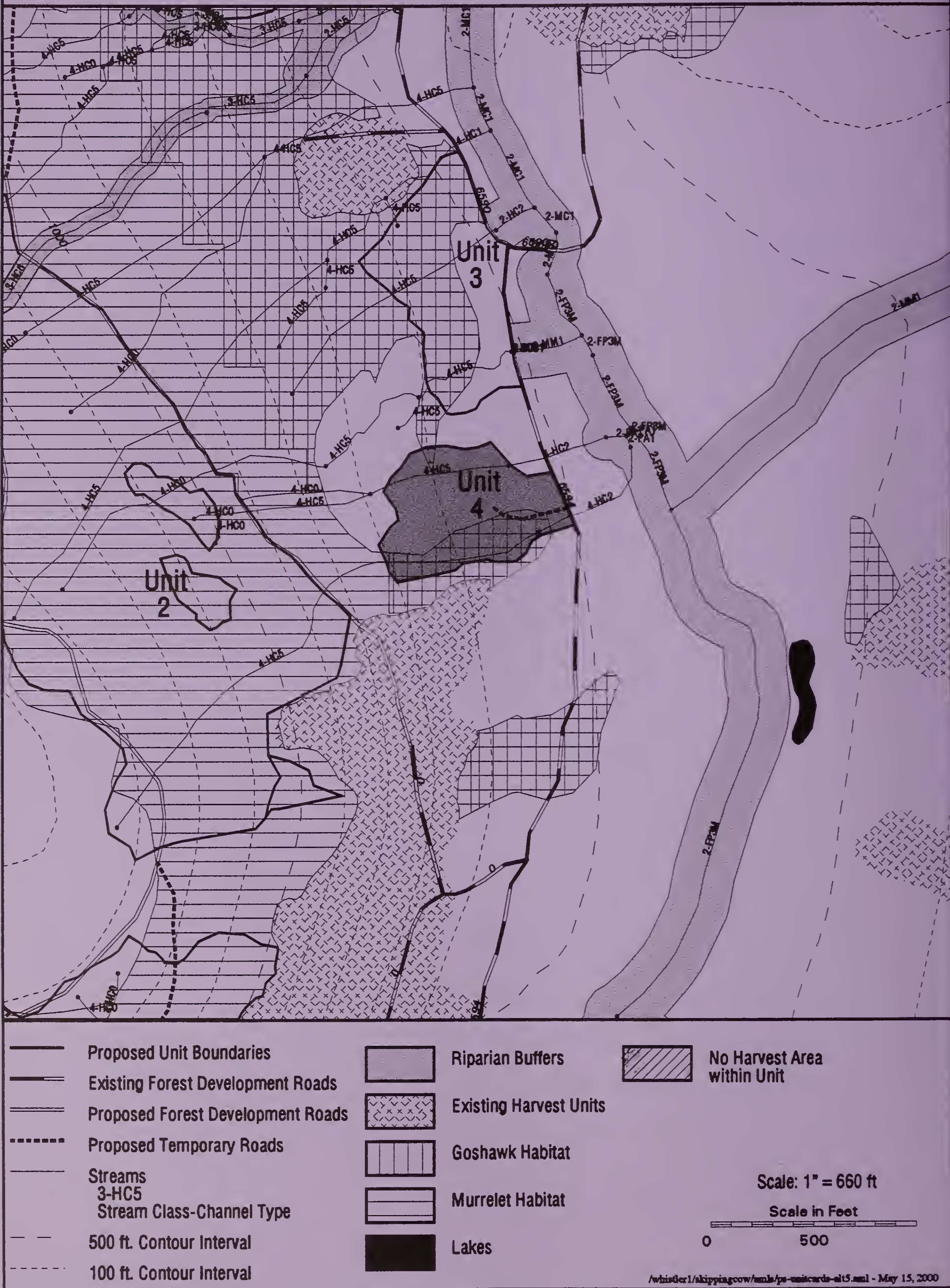
Mitigation: None needed.

Other Resources/Issues

Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 4, ALT: 5 - 9 ACRES



SKIPPING COW TIMBER SALE - UNIT CARD Unit 4 Alternative 5

Harvest Method: Highlead (downhill)
New road construction
Unit Size: 9 acres

Harvest Volume: 84 MBF

UNIT DEVELOPMENT

Stand Type:
Gap-phase blowdown area. Trees over 150 years old with pockets of younger aged trees.

Stand Management Objectives:
Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments: Release, possible planting, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries
Concern: Unit contains Class IV (HC5) streams tributary to Mustang Creek (tributary to North Meter Bight Creek).

Mitigation: Provide full suspension wherever possible across Class IV streams; at least partial suspension is required (BMPs 13.9, 13.16). F4

Soils/Wetlands
Concern:

Mitigation:

Wildlife/TES Plants
Concern: There are approximately 3 acres of high probability goshawk nesting habitat (see map).

Mitigation: Implement Forest-wide standards and guidelines if a goshawk nest is found. W1, W11

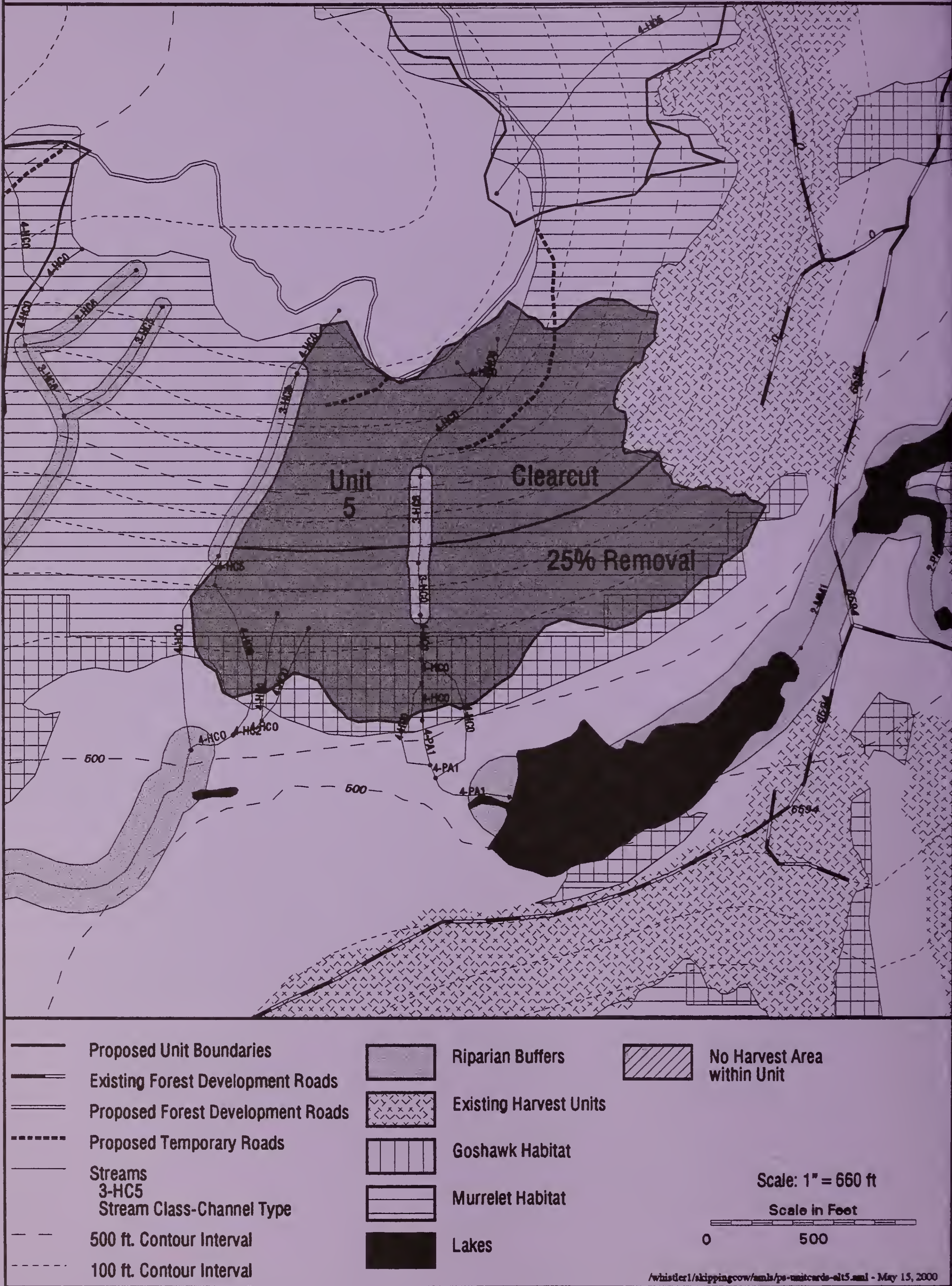
Visual/Recreation
Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway route.

Mitigation: None needed.

Other Resources/Issues
Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 5, ALT: 5 - 79 ACRES



SKIPPING COW TIMBER SALE - UNIT CARD Unit 5 Alternative 5

Harvest Method: Live skyline cable
New road construction
Unit Size: 79 acres

Harvest Volume: 1,070 MBF

UNIT DEVELOPMENT

Stand Type:
Upper portion: wind-prone area. Trees over 150 years old.
Lower portion: gap phase.

Stand Management Objectives:
Upper two-thirds of slope: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.
Lower one-third of slope: Future stand will be multi-aged.

Silvicultural Prescription:
Upper two-thirds of slope: Clearcut. Clearcutting is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and be the most economical method.
Lower third of slope: Remove approximately 25 percent of the trees over 9 inches DBH. Trees less than 9 inches DBH and 75 percent of the trees over 9 inches DBH will be retained throughout the unit. This prescription would address wildlife concerns, specifically, retention of higher value deer habitat, but it would not provide conditions suitable for regenerating spruce and would not be the most cost-effective method of harvesting trees. The combined prescription meets the wildlife, watershed, visual, timber, and other resource objectives.

Possible Future Treatments:
Release, possible planting, and pre-commercial thinning in upper two-thirds of unit.
Similar entry in 20 to 30 years.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries
Concern: Unit contains Class III (HC6) and Class IV (HC0) headwaters of Mustang Creek (tributary to North Meter Bight Creek) and Nesbitt Creek. Unit is near Mustang Lake. Unit is in area mapped as windthrow-prone; there is concern for stream buffer stability. Tailholds may be necessary within riparian buffers and across Mustang Lake.
Mitigation: Unit excludes sideslopes of Class III streams and provides about 400-foot no harvest buffer adjacent to Mustang Lake. Riparian trees felled for tailholds must be left in place. Western stream buffer is protected by undisturbed stand to the west. Internal stream buffer will be tied into steep-slope buffer and designed to avoid leaving large wind throw-prone trees, but some windthrow is anticipated in this area. Field review indicates that southern portion of unit is less prone to windthrow than northern portion due to slope position (BMPs 12.6, 12.6a). Provide full suspension wherever possible across Class IV streams; at least partial suspension is required (BMPs 13.9, 13.16). F1, F14, F15

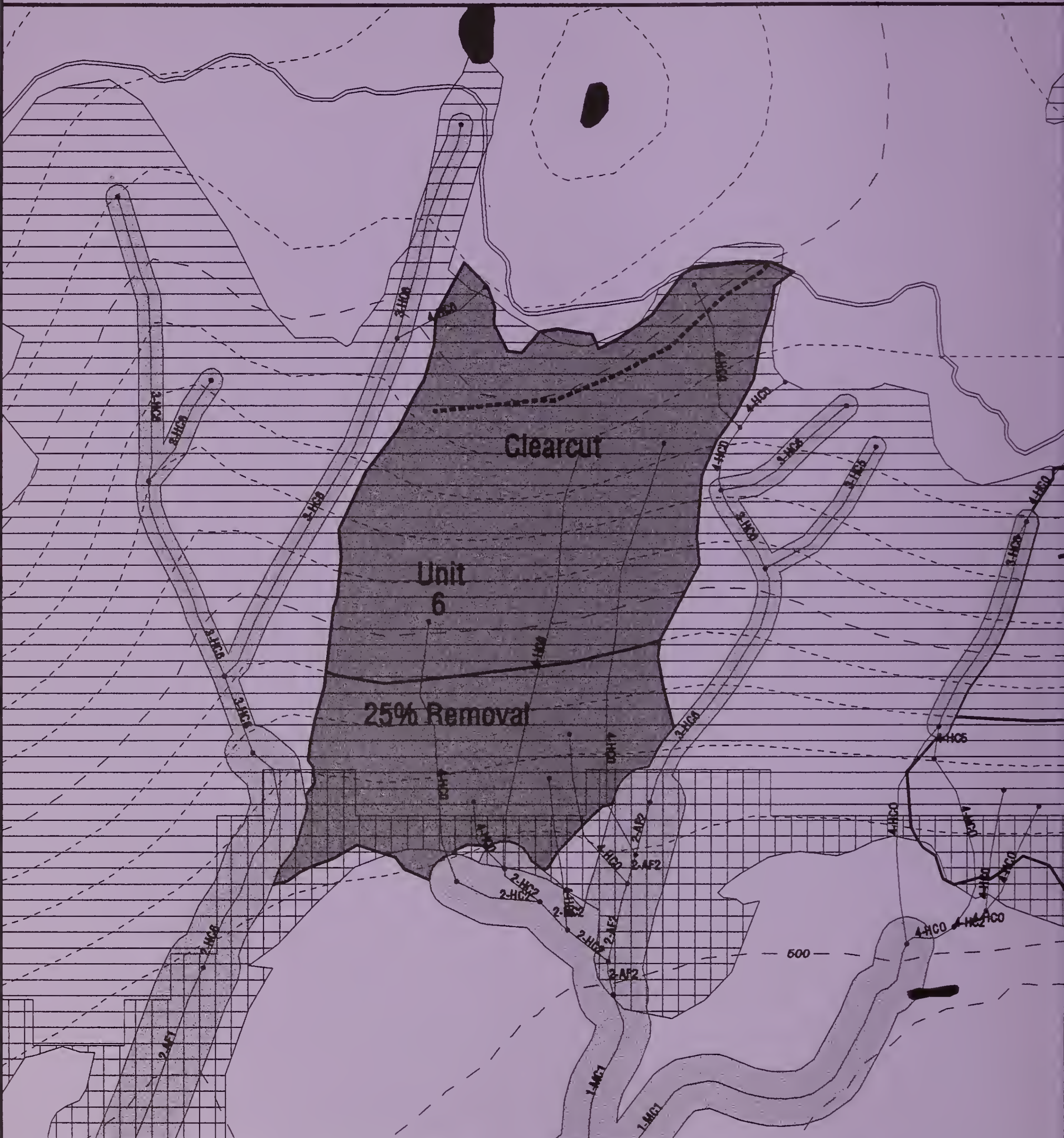
Soils/Wetlands
Concern: 5.5 acres of wetlands along the north end. Unit contains very steep slopes and cliffs adjacent to Class III stream.
Mitigation: Review during layout and remove areas with nonproductive soils from unit as required by Forest Plan standards and guidelines. Review during layout to avoid the steep, unstable slopes. F15

Wildlife/TES Plants
Concern: Southern one-third of unit has a high deer HCI value. There are approximately 7 acres of high probability goshawk nesting habitat (see map). Sandhill cranes use the area.
Mitigation: Implement Forest-wide standards and guidelines if a goshawk nest is found. Avoid road construction and logging activities between April 1 and June 15 to limit impacts to sandhill cranes. W9

Visual/Recreation
Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway route.
Mitigation: None needed.

Other Resources/Issues
Concern: Stand is in a wind-prone area. Blowdown along the edge is a concern.
Mitigation: Leave an irregular boundary on the east and north edge to create a feathered effect. O1

SKIPPING COW TIMBER HARVEST UNIT 6, ALT: 5 - 82 ACRES



	Proposed Unit Boundaries		Riparian Buffers		No Harvest Area within Unit
	Existing Forest Development Roads		Existing Harvest Units		
	Proposed Forest Development Roads		Goshawk Habitat		
	Proposed Temporary Roads		Murrelet Habitat		
	Streams 3-HC5 Stream Class-Channel Type		Lakes		
	500 ft. Contour Interval				
	100 ft. Contour Interval				

Scale: 1" = 660 ft

Scale in Feet

0 500

/whistler1/skippingcow/amls/ps-unitcards-alt5.aml - May 15, 2000

SKIPPING COW TIMBER SALE - UNIT CARD Unit 6 Alternative 5

Harvest Method: Live skyline cable
New road construction
Unit Size: 82 acres

Harvest Volume: 1,148 MBF

UNIT DEVELOPMENT

Stand Type:

Upper portion: wind-prone area. Trees over 150 years old.
Lower portion: gap phase blowdown area.

Stand Management Objectives:

Upper two-thirds of slope: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.
Lower one-third of slope: Future stand will be multi-aged.

Silvicultural Prescription:

Upper two-thirds of slope: Clearcut. Clearcutting is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method.
Lower third of slope: Remove approximately 25 percent of the trees over 9 inches DBH using an upper and lower diameter limit. Trees less than 9 inches DBH and 75 percent of the trees over 9 inches DBH will be retained throughout the unit. This prescription would address wildlife concerns, specifically, retention of higher value deer habitat, but it would not provide conditions suitable for regenerating spruce and would not be the most cost-effective method of harvesting trees. The combined prescription meets the wildlife, watershed, visual, timber, and other resource objectives.

Possible Future Treatments:

Possible planting, release, and pre-commercial thinning in upper two-thirds of unit.
Similar entry in 20 to 30 years.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Unit contains eight Class IV (HC0) streams flowing into Class II (HC2, AF1) headwaters of Nesbitt Creek. Class III (HC6) streams at east and west boundaries. Skyline anchors required in the riparian areas south of the unit to get adequate deflection. Unit is in area mapped as windthrow-prone; there is concern for stream buffer stability.
Mitigation: Unit provides at least 100-foot no harvest buffer adjacent to Class II streams to the east and west, and excludes Class II streams south of unit. Unit excludes sideslopes of Class III streams. Riparian trees felled for tailholds must be left in place. The stream buffers along east and west boundaries are primarily oriented with the prevailing storm winds; there is a minimum of exposed edge that is perpendicular to the wind. Western stream buffer is protected by undisturbed stand to the west. Eastern stream buffer follows topographical breaks, ties into smaller, windfirm scrub timber, and provides extended width buffer at southeast corner, associated with alluvial fan area. Field review indicates that southern portion of unit is less prone to windthrow than northern portion due to slope position (BMPs 12.6, 12.6a). Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F14

Soils/Wetlands

Concern: 6.5 acres of wetlands in the northeast corner.
Mitigation: Review during layout and remove areas with nonproductive soils from unit as required by Forest Plan standards and guidelines. O2

Wildlife/TES Plants

Concern: Southern one-quarter of unit has a high deer HCI value. There are approximately 8 acres of high probability goshawk nesting habitat (see map). There is a potential wildlife corridor along the stream in the northwest.
Mitigation: Implement Forest-wide standards and guidelines if a goshawk nest is found. Retain unmerchantable trees along stream. W6

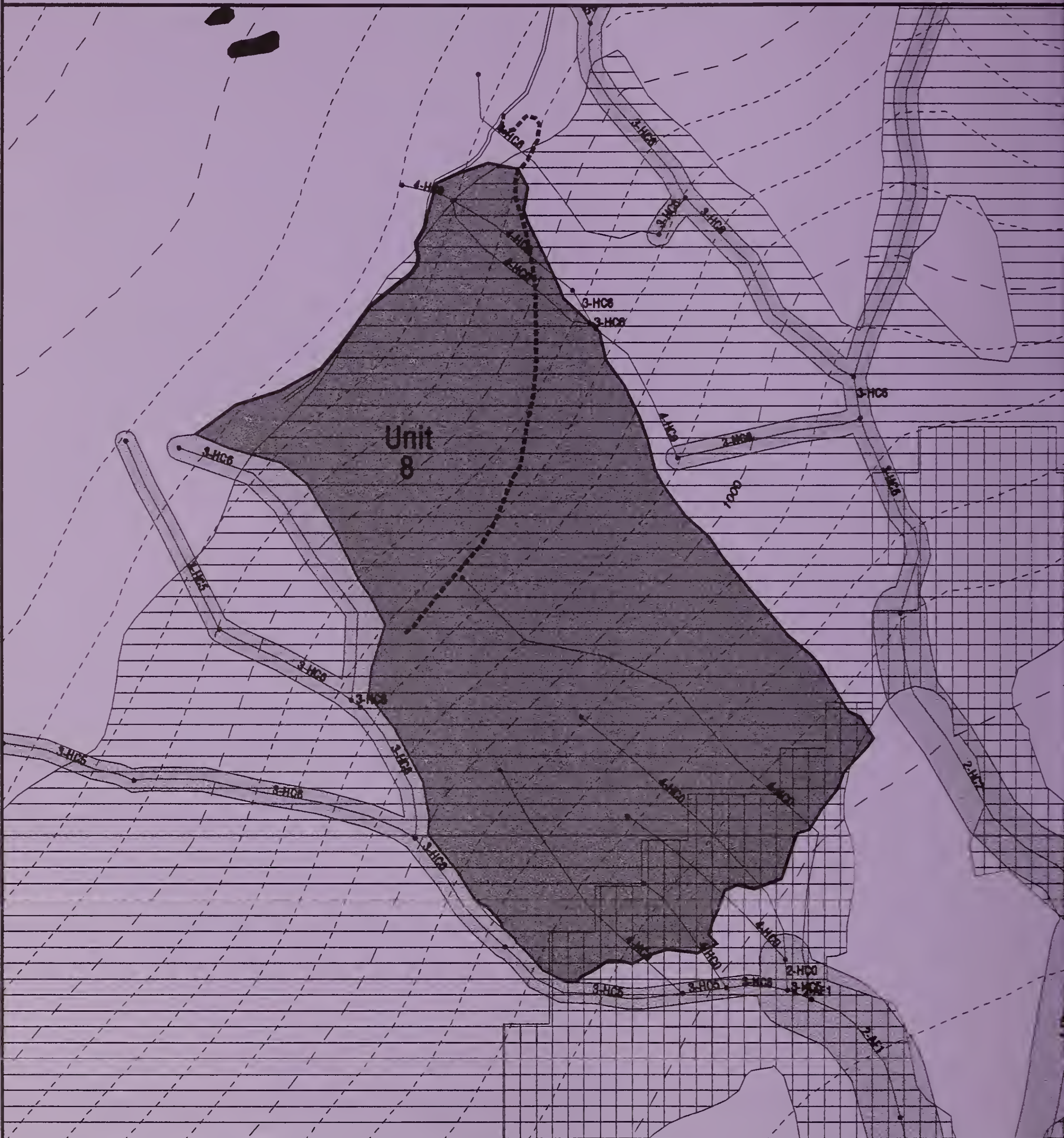
Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway route.
Mitigation: None needed.

Other Resources/Issues

Concern: Stand is in a wind-prone area. Blowdown along the edge is a concern.
Mitigation: Leave an irregular boundary on the east and north edge to create a feathered effect. O1

SKIPPING COW TIMBER HARVEST UNIT 8, ALT: 5 - 100 ACRES



Legend	
Proposed Unit Boundaries	Riparian Buffers
Existing Forest Development Roads	Existing Harvest Units
Proposed Forest Development Roads	Goshawk Habitat
Proposed Temporary Roads	Murrelet Habitat
Streams 3-HC5 Stream Class-Channel Type	Lakes
500 ft. Contour Interval	No Harvest Area within Unit
100 ft. Contour Interval	

Scale: 1" = 660 ft

Scale in Feet

0 500

/whistler1/skippingcow/amls/ps-unitcards-alt5.aml - May 15, 2000

SKIPPING COW TIMBER SALE - UNIT CARD Unit 8 Alternative 5

Harvest Method: Live skyline and highlead cable
New road construction
Unit Size: 100 acres

Harvest Volume: 3,116 MBF

UNIT DEVELOPMENT

Stand Type:
Wind-prone area. The upper 30 to 35 percent of the unit is young-growth sawtimber over 9 inches DBH but less than 150 years old. The remainder is over 150 years old, probably resulting from a windthrow event 250 years ago.

Stand Management Objectives:
Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly in the lower third of the slope. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Unit contains seven Class IV (HC0) streams flowing into Class II (AF1) headwaters of Nesbitt Creek. Class III (HC5, HC6) stream at southwest boundary. Skyline anchors required in the riparian areas southeast of the unit to get adequate deflection. Unit is in area mapped as windthrow-prone; there is concern for stream buffer stability.

Mitigation: Unit excludes sideslopes of Class III streams. Riparian trees felled for tailholds must be left in place. Western stream buffer is protected by undisturbed stand to the west. Eastern stream buffer follows topographical breaks, ties into smaller, windfirm scrub timber, and provides extended width buffer at southeast corner. Field review indicates that southern portion of unit is less prone to windthrow than northern portion due to slope position (BMPs 12.6, 12.6a). Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F14

Soils/Wetlands

Concern: 1 acre wetland along the southeast edge of the unit.
1 acre Kushnehin soil also along the southeast edge.

Mitigation: None needed.

Wildlife/TES Plants

Concern: There is a potential wildlife corridor along the stream on the southwest border. There are approximately 2 acres of high probability goshawk nesting habitat (see map).

Mitigation: Implement Forest-wide standards and guidelines if a goshawk nest is found. Retain unmerchantable trees along stream. W1, W9, W11, W33

Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. Upper edge seen from Alaska Marine Highway route.

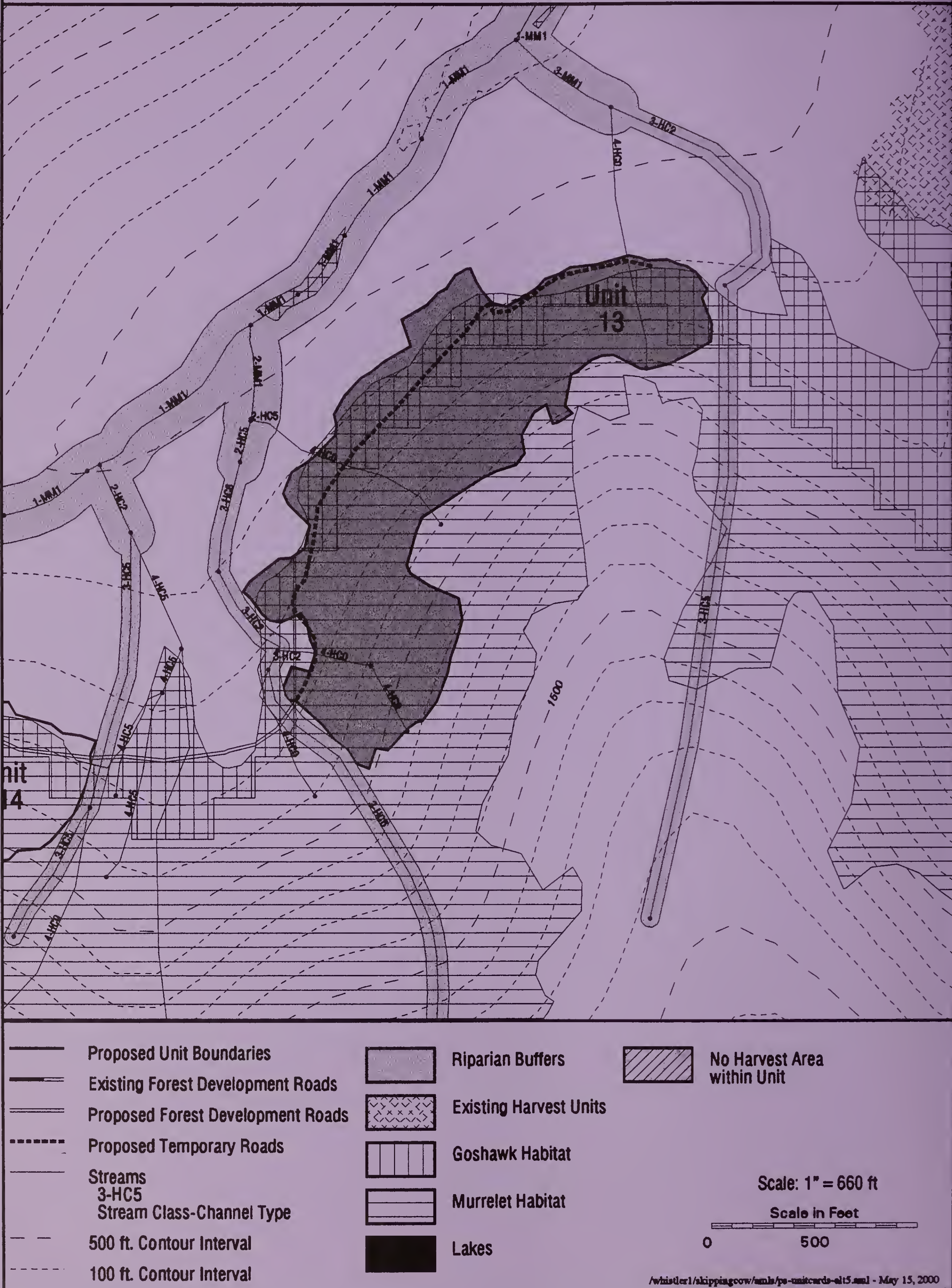
Mitigation: Vary the edges and backlines of the unit to give it a more natural shape. V1, V8

Other Resources/Issues

Concern: Stand is in a wind-prone area. Blowdown along the edge is a concern.

Mitigation: Leave an irregular boundary on the east and north edge to create a feathered effect. O1

SKIPPING COW TIMBER HARVEST UNIT 13, ALT: 5 - 48 ACRES



SKIPPING COW TIMBER SALE - UNIT CARD Unit 13 Alternative 5

Harvest Method: Cable (running skyline)
New road construction
Unit Size: 48 acres

Harvest Volume: 1,107 MBF

UNIT DEVELOPMENT

Stand Type:
Gap-phase blowdown area. Trees over 150 years old with younger aged trees and seedlings scattered throughout.

Stand Management Objectives:
Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Unit contains Class IV (HC0) streams flowing into Class I Middle Meter Bight Creek. Class III (HC5, HC6) streams at southwest and northeast unit boundaries.

Mitigation: Unit excludes sideslopes of Class III streams. Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F4, F6, F8, F14

Soils/Wetlands

Concern: Hazardous soil (MMI 4) above unit.

Mitigation: Keep backline below steep, slide-prone slope. F15

Wildlife/TES Plants

Concern: There are approximately 13 acres of high probability goshawk and approximately 33 acres are high probability marbled murrelet nesting habitat (see map). Southwestern portion of the unit has a high deer HCI value.

Mitigation: Implement Forest-wide standards and guidelines if a goshawk or murrelet nest is found. Retain at least five trees over 24 inches DBH to improve future murrelet nesting habitat. W1, W11, W17

Visual/Recreation

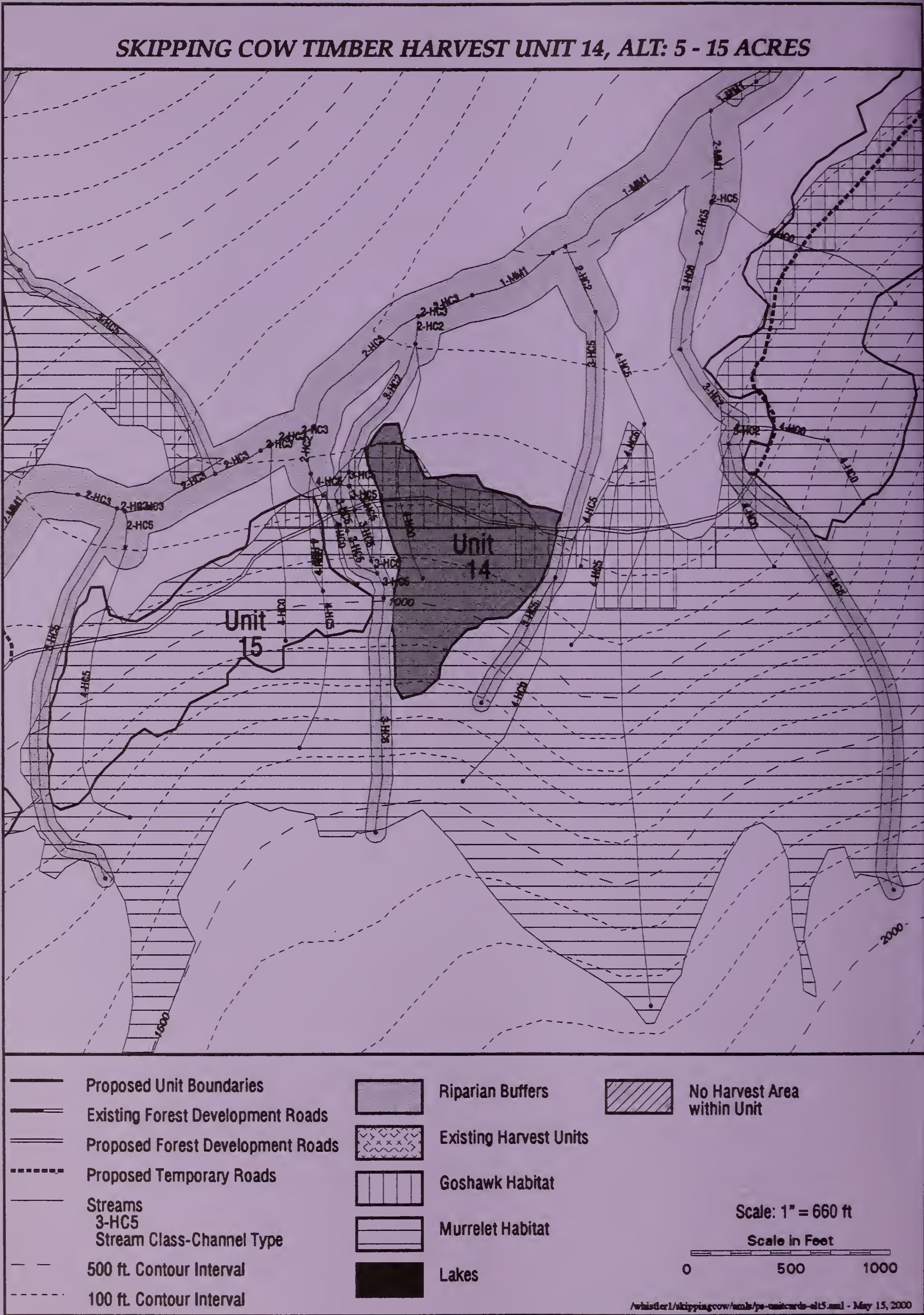
Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway.

Mitigation: None needed.

Other Resources/Issues

Concern:

Mitigation:


SKIPPING COW TIMBER HARVEST UNIT 14, ALT: 5 - 15 ACRES
Unit 14
Unit 15
1-MM1
2-HC5
3-HC5
4-HC5
1000
1500
2000
Proposed Unit Boundaries
Existing Forest Development Roads
Proposed Forest Development Roads
Proposed Temporary Roads
Streams
3-HC5
Stream Class-Channel Type
500 ft. Contour Interval
100 ft. Contour Interval
Riparian Buffers
Existing Harvest Units
Goshawk Habitat
Murrelet Habitat
Lakes
No Harvest Area within Unit
Scale: 1" = 660 ft
Scale in Feet
0
500
1000
/whistler1/skippingcow/amls/ps-unitcards-alt5.aml - May 15, 2000

SKIPPING COW TIMBER SALE - UNIT CARD Unit 14 Alternative 5

Harvest Method: Cable (running skyline)
New road construction
Unit Size: 15 acres

Harvest Volume: 366 MBF

UNIT DEVELOPMENT

Stand Type:
Gap-phase blowdown area. Trees over 150 years old with younger aged trees and seedlings scattered throughout.

Stand Management Objectives:
Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Unit is bounded by Class III (HC5, HC6) streams flowing into Class I Middle Meter Bight Creek. Unit contains a Class IV (HC0) stream.

Mitigation: Unit excludes sideslopes of Class III streams. Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F8, F14

Soils/Wetlands

Concern: Hazardous soil (MMI 4) above unit.

Mitigation: Keep backline below steep, slide-prone slope. F15

Wildlife/TES Plants

Concern: There are approximately 3 acres of high probability goshawk and 10 acres of high probability marbled murrelet nesting habitat (see map).

Mitigation: Implement Forest-wide standards and guidelines if a goshawk or murrelet nest is found. Retain at least five trees over 24 inches DBH to improve future murrelet nesting habitat. W1, W11, W17

Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway.

Mitigation: None needed.

Other Resources/Issues

Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 15, ALT: 5 - 24 ACRES

Proposed Unit Boundaries

Existing Forest Development Roads

Proposed Forest Development Roads

Proposed Temporary Roads

Streams
3-HC5
Stream Class-Channel Type

500 ft. Contour Interval

100 ft. Contour Interval

Riparian Buffers

Existing Harvest Units

Goshawk Habitat

Murrelet Habitat

Lakes

No Harvest Area within Unit

Scale: 1" = 660 ft

Scale in Feet

0 500

/whistler1/skippingcow/amls/ps-unitcards-alt5.aml - May 15, 2000

SKIPPING COW TIMBER SALE - UNIT CARD Unit 15 Alternative 5

Harvest Method: Cable (running skyline)
New road construction
Unit Size: 24 acres

Harvest Volume: 624 MBF

UNIT DEVELOPMENT

Stand Type:
Gap-phase blowdown area. Trees over 150 years old with younger aged trees and seedlings scattered throughout.

Stand Management Objectives:
Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Unit is bounded by Class III (HC5, HC6) streams flowing into Class I Middle Meter Bight Creek. Unit contains four Class IV (HC0) streams.

Mitigation: Unit excludes sideslopes of Class III streams. Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F3, F4, F8, F14

Soils/Wetlands

Concern: Hazardous soil (MMI 4) above unit.

Mitigation: Keep backline below steep, slide-prone slope. F15

Wildlife/TES Plants

Concern: There are approximately 24 acres of high probability marbled murrelet nesting habitat (see map).

Mitigation: Implement Forest-wide standards and guidelines if a murrelet nest is found. Retain at least five trees over 24 inches DBH to improve future murrelet nesting habitat. W1, W17

Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway.

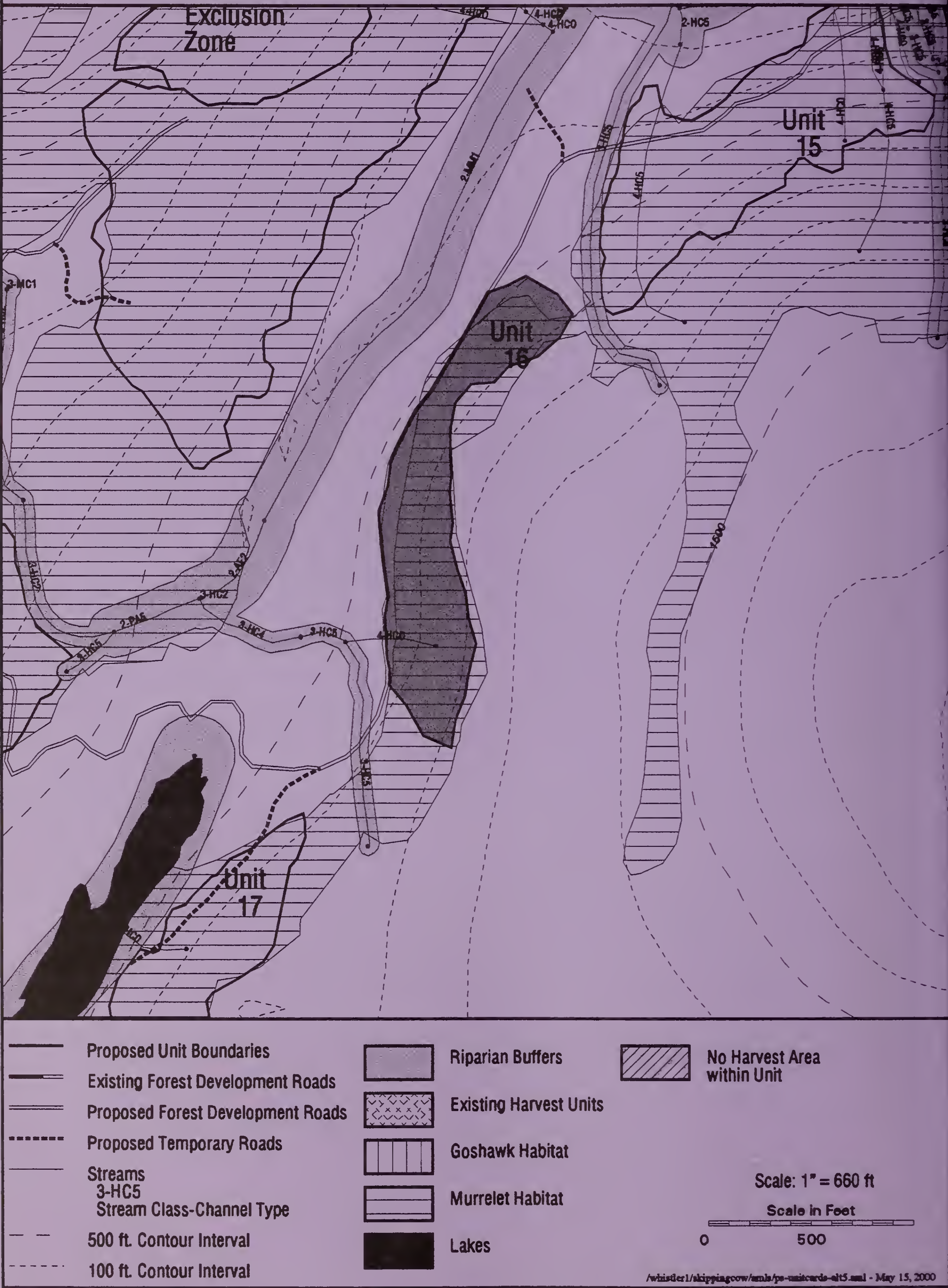
Mitigation: None needed.

Other Resources/Issues

Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 16, ALT: 5 - 17 ACRES



SKIPPING COW TIMBER SALE - UNIT CARD Unit 16 Alternative 5

Harvest Method: Cable (running skyline)
New road construction
Unit Size: 17 acres

Harvest Volume: 295 MBF

UNIT DEVELOPMENT

Stand Type:
Gap-phase blowdown area. Trees over 150 years old with younger aged trees and seedlings scattered throughout.

Stand Management Objectives:
Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Unit contains one Class IV (HC0) stream flowing into headwaters of Middle Meter Bight Creek.

Mitigation: Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F14

Soils/Wetlands

Concern: Approximately 15 acres wetland soils scattered through the unit.

Mitigation: Review during layout and remove areas with nonproductive soils from unit as required by Forest Plan standards and guidelines. O2

Wildlife/TES Plants

Concern:

Mitigation: W1

Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway.

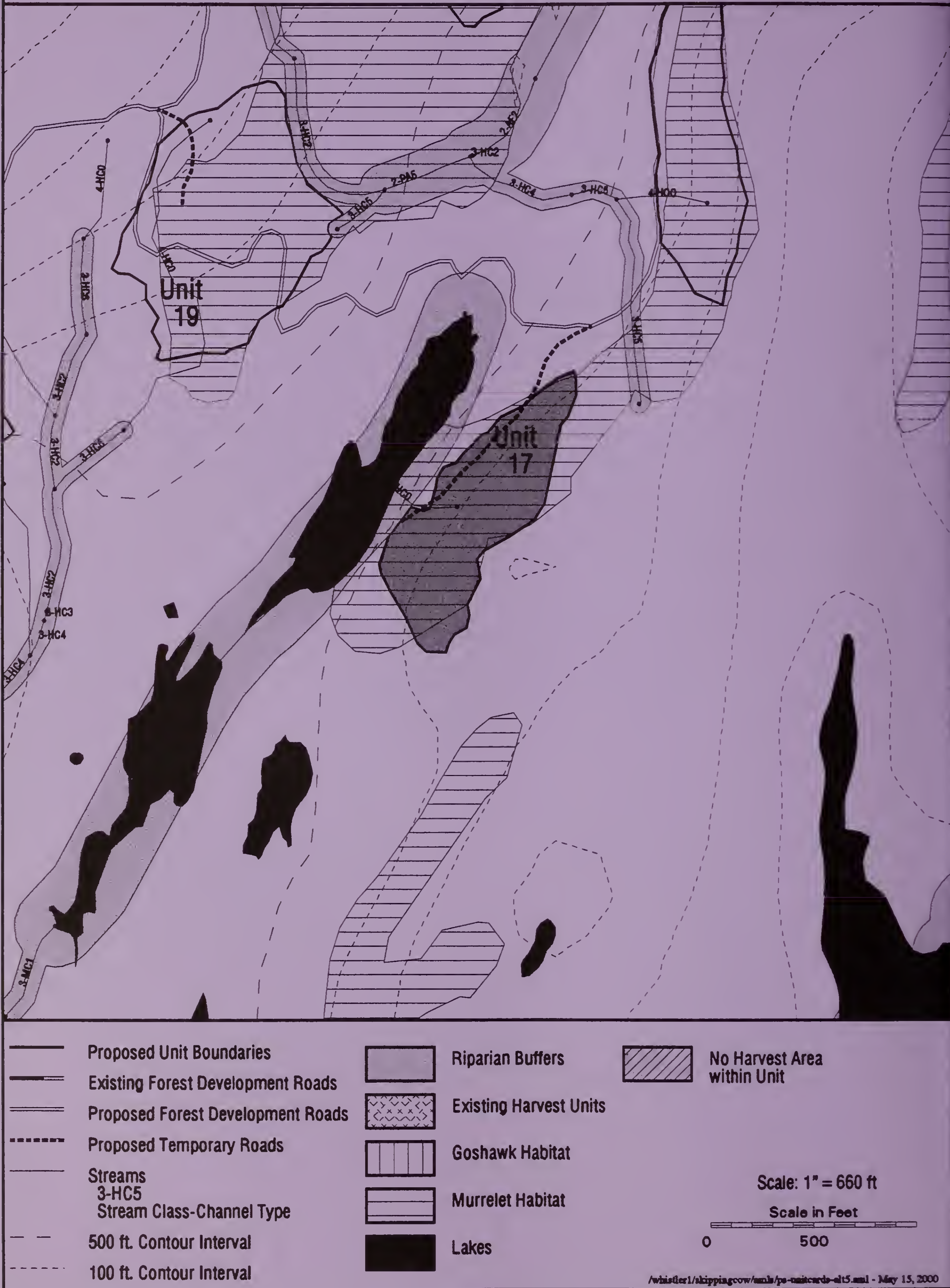
Mitigation: None needed.

Other Resources/Issues

Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 17, ALT: 5 - 12 ACRES



SKIPPING COW TIMBER SALE - UNIT CARD Unit 17 Alternative 5

Harvest Method: Cable (running skyline)
New road construction
Unit Size: 12 acres

Harvest Volume: 254 MBF

UNIT DEVELOPMENT

Stand Type:
Gap-phase blowdown area. Trees over 150 years old with younger aged trees and seedlings scattered throughout.

Stand Management Objectives:
Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Unit contains one Class IV (HC0) stream flowing into headwaters of Vial Creek. Unit is adjacent to lake.

Mitigation: Unit provides at least 100-foot no harvest buffer adjacent to lake (BMPs 12.6, 12.6a). Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1

Soils/Wetlands

Concern: 1 acre of wetland in the north portion of the unit.

Mitigation: None needed.

Wildlife/TES Plants

Concern:

Mitigation: W1

Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway.

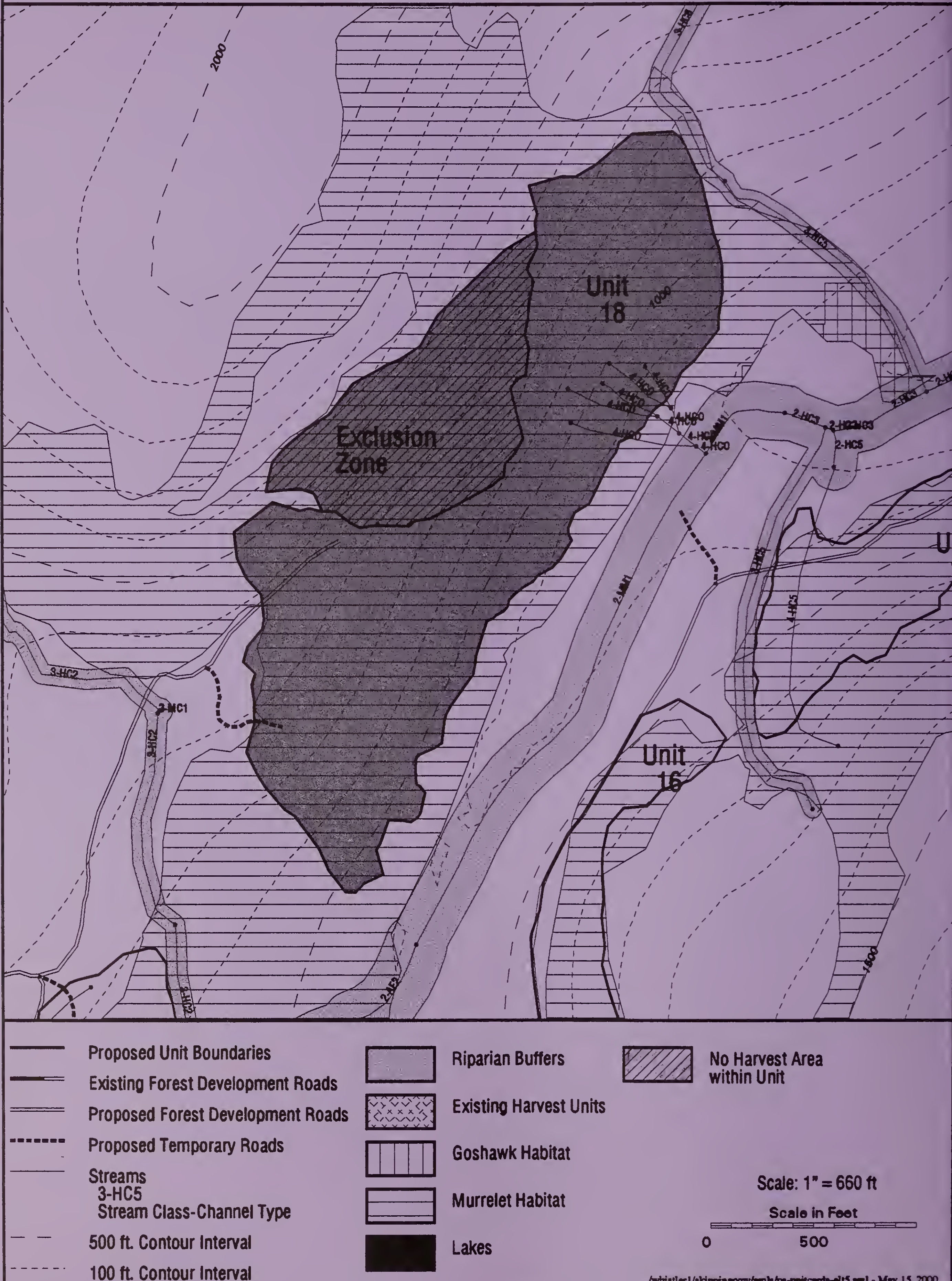
Mitigation: None needed.

Other Resources/Issues

Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 18, ALT: 5 - 70 ACRES



SKIPPING COW TIMBER SALE - UNIT CARD Unit 18 Alternative 5

Harvest Method: Cable (running skyline/slackline)
New road construction
Unit Size: 70 acres

Harvest Volume: 1,566 MBF

UNIT DEVELOPMENT

Stand Type:
Wind-prone area. Trees over 150 years old with pockets of younger aged trees and areas of stand initiation.

Stand Management Objectives:
Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives in the lower one-third of the unit.

Silvicultural Prescription:
The upper two-thirds of the unit will be clearcut. The lower third will be clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups in the lower third of the slope. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Unit is adjacent to Class II (MM1) Middle Meter Bight Creek, Class III (HC6) tributary at northeast, contains several Class IV (HC0) tributaries. Logging plan calls for yarding from spur road south of (across) Middle Meter Bight Creek. Unit is in area mapped as windthrow-prone; there is concern for stream buffer stability.

Mitigation: Unit provides at least 120-foot no harvest buffer adjacent to Middle Meter Bight Creek. This buffer is parallel to predominant wind direction and expected to be relatively windfirm. Profiles in slackline setting indicate full suspension across Middle Meter Bight is possible. ***Consult fisheries specialist*** during designation of yarding corridors and development of streamcourse protection plan. Unit excludes sideslopes of Class III stream. This buffer is perpendicular to dominant wind direction and ***requires additional field review*** for buffer stability (BMPs 12.6, 12.6a). Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F6, F14

Soils/Wetlands

Concern: Steep slope above unit.

Mitigation: Keep backline below steep slope. F15

Wildlife/TES Plants

Concern:

Mitigation: W1

Visual/Recreation

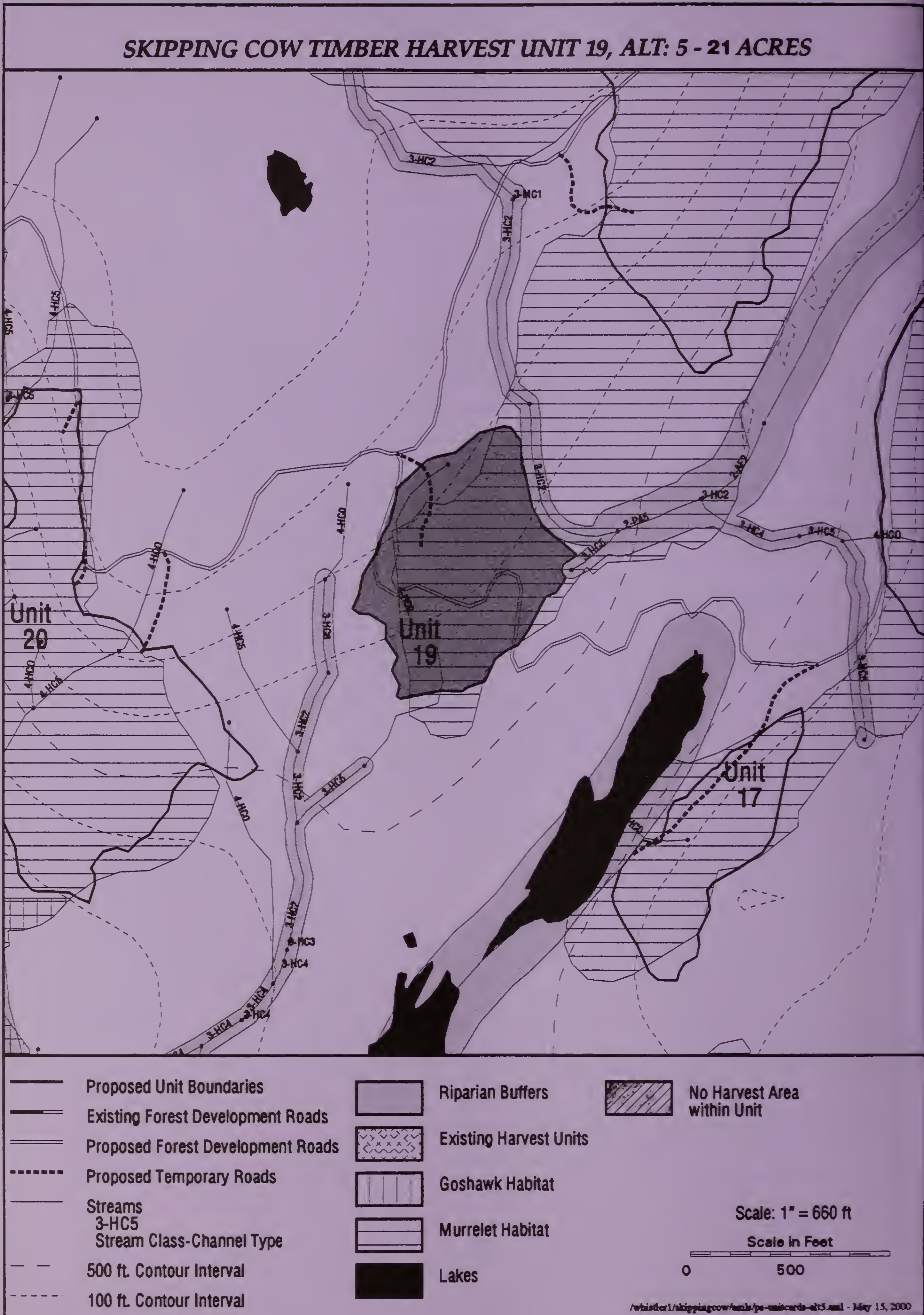
Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway.

Mitigation: None needed.

Other Resources/Issues

Concern: Stand is in a wind-prone area. Blowdown along the edge is a concern.

Mitigation: Leave an irregular boundary on the east and north edge to create a feathered effect. O1


SKIPPING COW TIMBER HARVEST UNIT 19, ALT: 5 - 21 ACRES
Unit 20
Unit 19
Unit 17
3-HC2
3-MC1
3-HC5
3-HC4
3-HC3
4-HC0
4-HC5
2-PA5
Proposed Unit Boundaries
Existing Forest Development Roads
Proposed Forest Development Roads
Proposed Temporary Roads
Streams
3-HC5
Stream Class-Channel Type
500 ft. Contour Interval
100 ft. Contour Interval
Riparian Buffers
Existing Harvest Units
Goshawk Habitat
Murrelet Habitat
Lakes
No Harvest Area within Unit
Scale: 1" = 660 ft
Scale in Feet
0
500
/whistler1/skippingcow/amls/ps-unitcards-alt5.aml - May 15, 2000

Harvest Method: Highlead (uphill)
New road construction
Unit Size: 21 acres

Harvest Volume: 375 MBF

UNIT DEVELOPMENT

Stand Type:
Wind-prone area. Trees over 150 years old with pockets of younger aged trees and areas of stand initiation.

Stand Management Objectives:
Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Middle Meter Bight Class III (HC2) tributary northeast of unit. Unit contains Class IV (HC0) headwaters of Vial Creek. Unit is in area mapped as windthrow-prone; there is concern for stream buffer stability.

Mitigation: Unit excludes sideslope of Class III stream. This buffer is perpendicular to dominant wind direction and ***requires additional field review*** for buffer stability (BMPs 12.6, 12.6a). Class IV stream location ***requires additional field review***. Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F14

Soils/Wetlands

Concern:

Mitigation:

Wildlife/TES Plants

Concern:

Mitigation: W1

Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway.

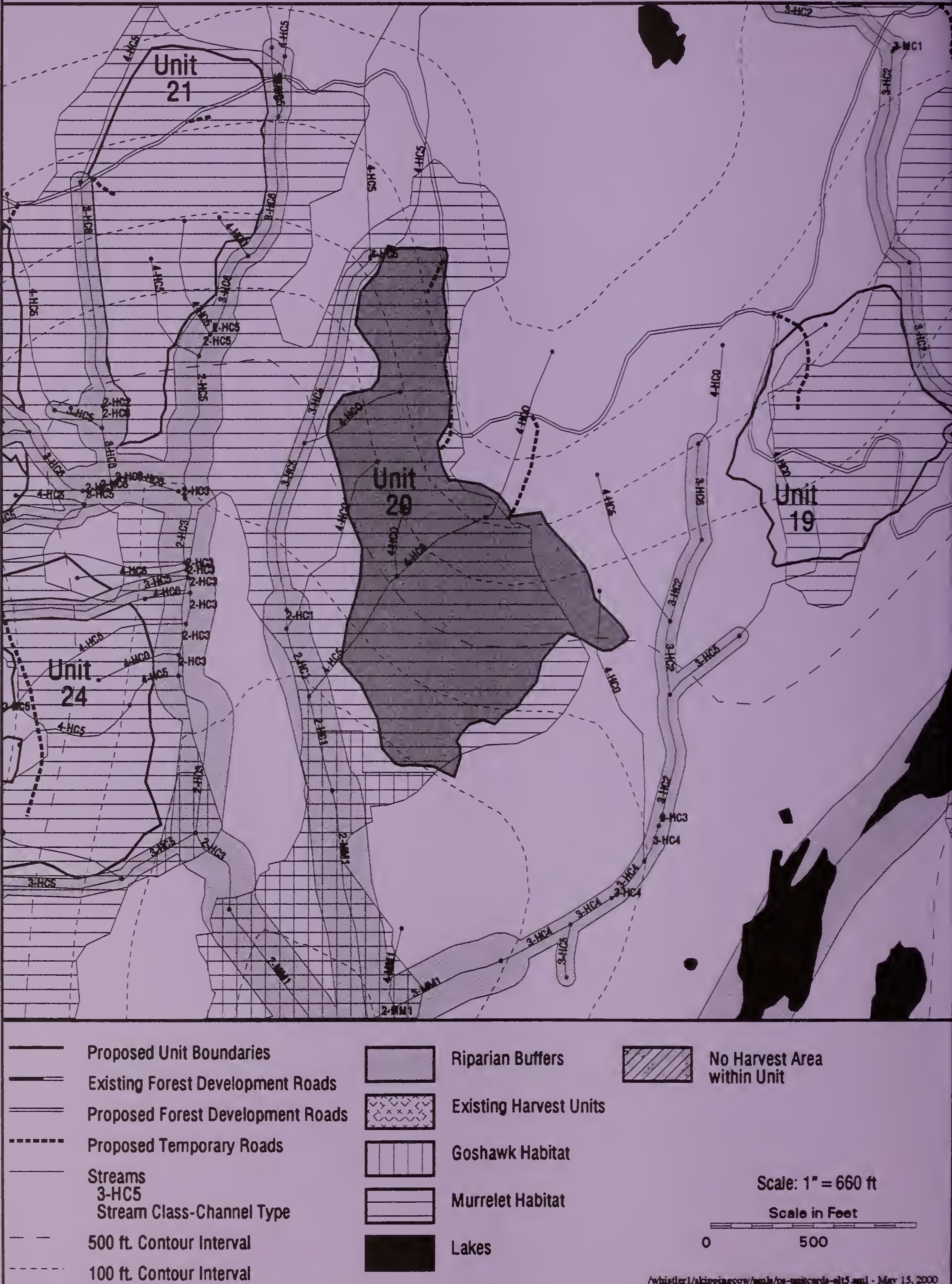
Mitigation: None needed.

Other Resources/Issues

Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 20, ALT: 5 - 40 ACRES



Harvest Method: Running skyline/slackline
New road construction
Unit Size: 40 acres

Harvest Volume: 855 MBF

UNIT DEVELOPMENT

Stand Type:
Wind-prone area. Trees over 150 years old with pockets of younger aged trees and areas of stand initiation.

Stand Management Objectives:
Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives in the lower one-third of the unit.

Silvicultural Prescription:
The upper two thirds of the unit will be clearcut. The lower third will be clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups in the lower third of the slope. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Unit contains five Class IV (HC0, HC5) tributaries to Vial Creek. Vial Creek Class II and III (HC1) west of unit. Unit is in area mapped as windthrow-prone; there is concern for stream buffer stability.

Mitigation: Unit provides wide buffer along Vial Creek to avoid blind leads. Buffer is parallel to dominant wind direction and is expected to be relatively windfirm (BMPs 12.6, 12.6a). Class IV stream location ***requires additional field review*** to ensure it is not Class III. Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F3, F8, F14

Soils/Wetlands

Concern: Approximately 9 acres wetlands scattered through the unit, ranging from 1 to 6 acres.

Mitigation: Review during layout and remove areas with nonproductive soils from unit as required by Forest Plan standards and guidelines. O2

Wildlife/TES Plants

Concern: There are approximately 2 acres of high probability goshawk nesting habitat (see map).

Mitigation: Implement Forest-wide standards and guidelines if a goshawk nest is found. W1, W11

Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. With a clearcut prescription, upper portion of unit would be barely visible from Alaska Marine Highway.

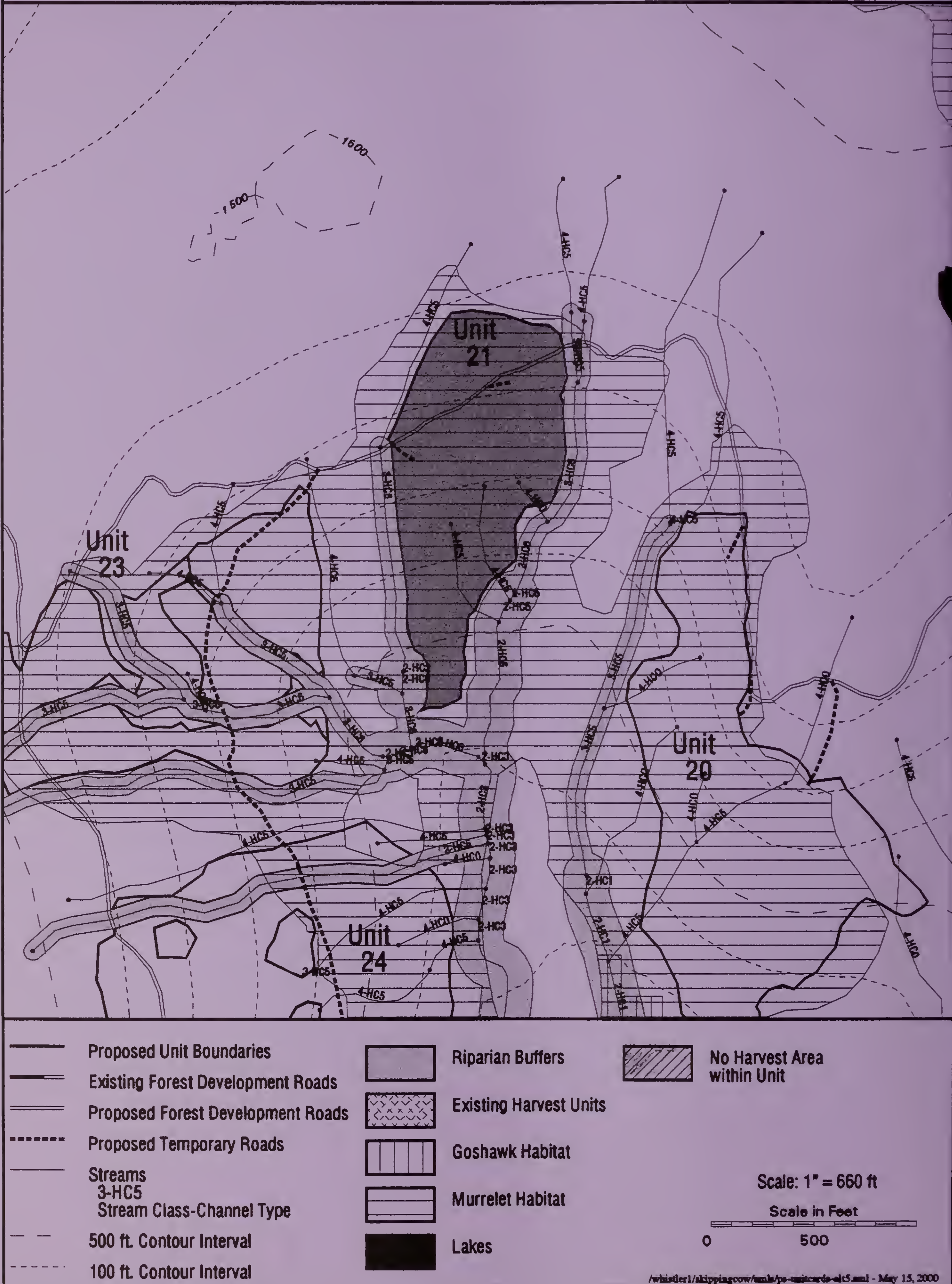
Mitigation: Vary backline and edges of unit to give unit a more natural shape. V1, V8

Other Resources/Issues

Concern: Stand is in a wind-prone area. Blowdown along the edge is a concern.

Mitigation: Leave an irregular boundary on the east and north edge to create a feathered effect. O1

SKIPPING COW TIMBER HARVEST UNIT 21, ALT: 5 - 25 ACRES



SKIPPING COW TIMBER SALE - UNIT CARD Unit 21 Alternative 5

Harvest Method: Highlead (downhill) and Live skyline.
New road construction Harvest Volume: 534 MBF
Unit Size: 25 acres

UNIT DEVELOPMENT

Stand Type:
Wind-prone area. Trees over 150 years old with pockets of younger aged trees and areas of stand initiation.

Stand Management Objectives:
Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives in the lower third of the unit.

Silvicultural Prescription:
The upper two-thirds of the unit will be clearcut. The lower third will be clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups in the lower third of the slope. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce; reduce mistletoe; and be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Unit bounded by Class III (HC6) and Class II (HC5, HC6) tributaries to Vial Creek. Unit contains three Class IV (HC5, HC0) tributaries to Vial Creek. Upper portion of unit is in area mapped as windthrow-prone; lower portion receives topographical protection and reduces concern for stream buffer stability.

Mitigation: Unit excludes sideslopes of Class III streams and provides at least 100-foot no harvest buffer along Class II reaches. Buffer is parallel to predominant wind direction or protected by topography and undisturbed stand to the south and expected to be relatively windfirm (BMPs 12.6, 12.6a). Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F4, F8, F14

Soils/Wetlands

Concern: Original unit had a 3-acre and a 0.1-acre wetland located along the east edge of the unit.

Mitigation: These areas were dropped during layout. O2.

Wildlife/TES Plants

Concern:

Mitigation: W1

Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. Unit barely visible from Alaska Marine Highway.

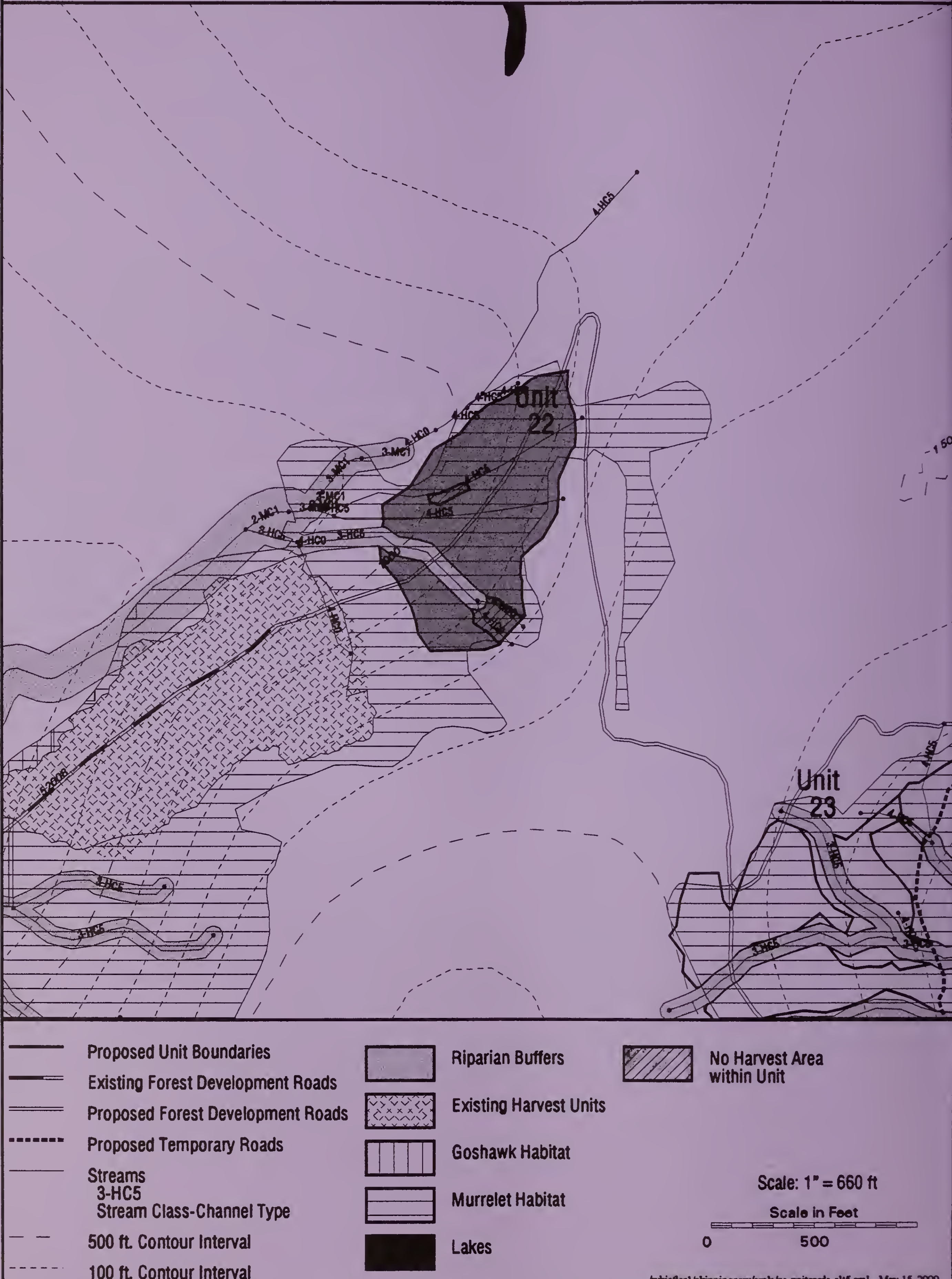
Mitigation: Vary backline and edges of unit to give unit a more natural shape. Try to leave more trees on the downhill portion of the road to partially screen the unit from the Alaska Marine Highway. V1, V8

Other Resources/Issues

Concern: Stand is in a wind-prone area. Blowdown along the edge is a concern.

Mitigation: Leave an irregular boundary on the east, west, and north edge to create a feathered effect. O1

SKIPPING COW TIMBER HARVEST UNIT 22, ALT: 5 - 18 ACRES



/whistler1/skippingcow/amls/ps-unitcards-alt5.aml - May 15, 2000

Harvest Method: Highlead (both uphill and downhill)
New road construction   Harvest Volume: 376 MBF
Unit Size: 18 acres

UNIT DEVELOPMENT

Stand Type:
Gap-phase blowdown area. Trees over 150 years old with pockets of younger aged trees.

Stand Management Objectives:
Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Unit contains Class III (HC5) and Class IV (HC0) headwaters of Snail Creek, tributary of Nesbitt Creek.

Mitigation: Unit excludes sideslopes of Class III streams (BMPs 12.6, 12.6a). Road location provides for split yarding by locating setting boundaries on stream courses. Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F4, F14, F17

Soils/Wetlands

Concern:

Mitigation:

Wildlife/TES Plants

Concern:

Mitigation: W1, W9

Visual/Recreation

Concern: Visual Quality Objectives = Maximum Modification. Upper 1/5 of unit visible from Alaska Marine Highway.

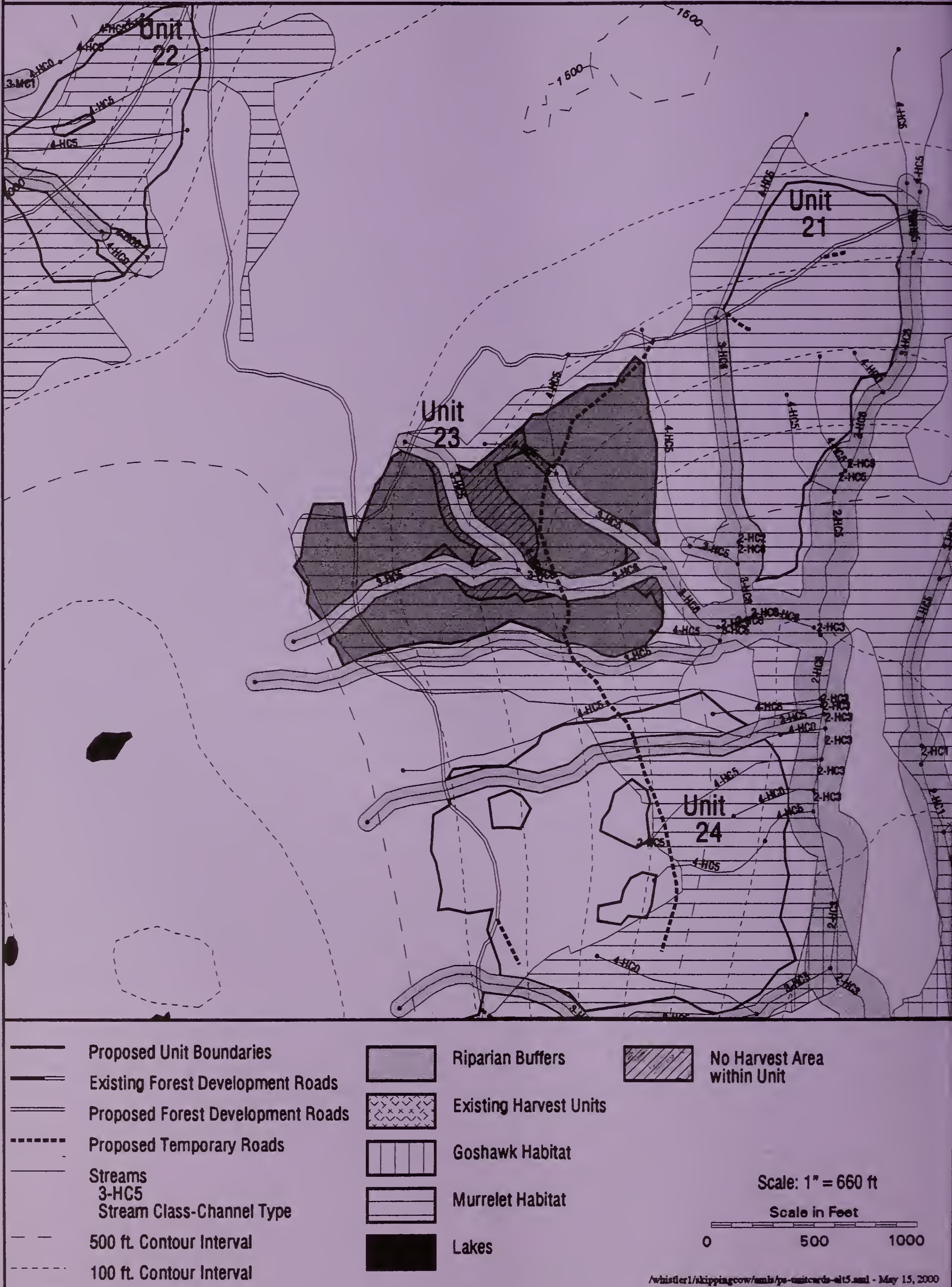
Mitigation: Vary edges and backlines of unit to give unit a more natural shape. Try to leave more reserve trees below road than in the rest of unit to soften views of the unit (and road) from the Alaska Marine Highway. V1, V8

Other Resources/Issues

Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 23, ALT: 5 - 28 ACRES



SKIPPING COW TIMBER SALE - UNIT CARD Unit 23 Alternative 5

Harvest Method: Highlead (both uphill and downhill)
New road construction
Unit Size: 28 acres

Harvest Volume: 624 MBF

UNIT DEVELOPMENT

Stand Type: Gap-phase blowdown area. Trees over 150 years old with pockets of younger aged trees.

Stand Management Objectives:
Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Release, possible planting, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Unit is bounded by and contains Class III (HC5, HC6) and Class IV (HC5, HC0) tributaries to Vial Creek. Unit receives topographical protection from dominant wind direction. Most stream buffers consist of small, scrubby timber, not prone to windthrow.

Mitigation: Unit excludes sideslopes of Class III streams (BMPs 12.6, 12.6a). Road location provides for split yarding by locating setting boundaries on stream courses. Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F4, F8, F14

Soils/Wetlands

Concern: Three wetlands, ranging from 0.2 acre to 1 acre are in the unit.

Mitigation: None needed.

Wildlife/TES Plants

Concern:

Mitigation: W1, W9

Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. With a clearcut prescription, the uphill portion of unit would be visible from the Alaska Marine Highway.

Mitigation: Vary backline and edges of unit to give unit a more natural shape. V1, V8

Other Resources/Issues

Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 24, ALT: 5 - 50 ACRES

SKIPPING COW TIMBER SALE - UNIT CARD Unit 24 Alternative 5

Harvest Method: Highlead (uphill)
New road construction
Unit Size: 50 acres

Harvest Volume: 825 MBF

UNIT DEVELOPMENT

Stand Type:
Gap-phase blowdown area. Trees over 150 years old with pockets of younger aged trees.

Stand Management Objectives:
Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Release, possible planting, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Unit is bounded by and contains Class III (HC5) and Class IV (HC5, HC0) tributaries to Vial Creek. Unit receives topographical protection from dominant wind direction. Most stream buffers consist of small, scrubby timber, not prone to windthrow.

Mitigation: Unit excludes sideslopes of Class III streams (BMPs 12.6, 12.6a). Road location provides for split yarding by locating setting boundaries on stream courses. North Class III stream ***requires additional field review*** to evaluate need for buffer (it may be Class IV). Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F8, F14

Soils/Wetlands

Concern: 4 acres of wetlands in the middle of the unit (one 0.4 acre and one 3.4 acres).

Mitigation: Review during layout and remove areas with nonproductive soils from unit as required by Forest Plan standards and guidelines.

Wildlife/TES Plants

Concern: The unit contains potential wolf denning habitat.

Mitigation: W1, W8, W9, W21, W22

Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. With a clearcut prescription, the uphill portion of unit would be visible from the Alaska Marine Highway.

Mitigation: Vary backline and edges of unit to give unit a more natural shape. V1, V8

Other Resources/Issues

Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 25, ALT: 5 - 86 ACRES

Proposed Unit Boundaries
Existing Forest Development Roads
Proposed Forest Development Roads
Proposed Temporary Roads
Streams
3-HC5
Stream Class-Channel Type
500 ft. Contour Interval
100 ft. Contour Interval

Riparian Buffers
Existing Harvest Units
Goshawk Habitat
Murrelet Habitat
Lakes

No Harvest Area within Unit

Scale: 1" = 660 ft
Scale in Feet
0 500

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SKIPPING COW TIMBER SALE - UNIT CARD Unit 25 Alternative 5

Harvest Method: Slackline/Highlead (downhill)
New road construction Harvest Volume: 1,691 MBF
Unit Size: 86 acres

UNIT DEVELOPMENT

Stand Type:
Wind-prone area. Trees over 150 years old with pockets of younger aged trees and areas of stand initiation.

Stand Management Objectives:
Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives in the lower third of the unit.

Silvicultural Prescription:
The upper two-thirds of the unit will be clearcut. The lower third will be clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups in the lower third of the slope. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Unit is adjacent to Vial Creek Class II (MC1) and contains Class IV (HC5, HC0) tributaries to Vial Creek. A Class III (HC5) tributary to Vial Creek bounds the south end of the unit. Unit is in area mapped as windthrow-prone; there is concern for stream buffer stability.

Mitigation: Unit provides at least 100-foot no harvest buffer along Class III stream. This buffer is parallel to predominant wind direction and timber is mostly scrub, expected to be windfirm. Unit excludes sideslopes of Class III stream. This buffer is protected by undisturbed stand to the south (BMPs 12.6, 12.6a). Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F3, F4, F14

Soils/Wetlands

Concern: There is a 0.4-acre wetland in the southern portion of the unit. Recent landslide in upper portion of unit (below road).

Mitigation: Provide partial or full suspension across unstable area. F15, F17, F18

Wildlife/TES Plants

Concern: There are approximately 6 acres of potential goshawk nesting habitat (see map). The unit is potential wolf denning habitat.

Mitigation: Implement Forest-wide standards and guidelines if a goshawk nest is found. W1, W8, W11, W21, W22

Visual/Recreation

Concern: Visual Quality Objectives = Maximum Modification. Most of unit visible from Alaska Marine Highway.

Mitigation: For all alternatives, vary edges and backlines of unit to give unit a more natural shape. Try to leave more reserve trees in eastern and southern portions of unit than in the rest of unit to soften views of the unit from the Alaska Marine Highway. V1, V8

Other Resources/Issues

Concern: Stand is in a wind-prone area. Blowdown along the edge is a concern.

Mitigation: Leave an irregular boundary on the east and north edge to create a feathered effect. O1

SKIPPING COW TIMBER HARVEST UNIT 26, ALT: 5 - 23 ACRES

Proposed Unit Boundaries	Riparian Buffers	No Harvest Area within Unit
Existing Forest Development Roads	Existing Harvest Units	
Proposed Forest Development Roads	Goshawk Habitat	
Proposed Temporary Roads	Murrelet Habitat	
Streams 3-HC5 Stream Class-Channel Type	Lakes	
500 ft. Contour Interval		
100 ft. Contour Interval		

Scale: 1" = 660 ft

Scale in Feet

0 500

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SKIPPING COW TIMBER SALE - UNIT CARD Unit 26 Alternative 5

Harvest Method: Slackline across Vial Cr.
No new road construction
Unit Size: 23 acres

Harvest Volume: 411 MBF

UNIT DEVELOPMENT

Stand Type:
Wind-prone area. Trees over 150 years old with pockets of younger aged trees and areas of stand initiation.

Stand Management Objectives:
Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, reduce mistletoe, and be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Unit is adjacent to Vial Creek Class II (MC1, HC1). Class III (HC6) Vial Creek tributary bounds unit at north. One Class IV (HC0) tributary within unit. Unit is in area mapped as windthrow-prone; there is concern for stream buffer stability. Logging plan calls for yarding across Vial Creek to end of Road 6594 in Unit 25.

Mitigation: Unit provides at least 100-foot no harvest buffer along Class II stream. This buffer is parallel to predominant wind direction and timber is mostly scrub, expected to be windfirm. Profiles indicate full suspension is possible across Vial Creek. ***Consult fisheries specialist*** during designation of yarding corridors and development of streamcourse protection plan. Unit excludes sideslopes of Class III stream. This buffer is includes additional tree length for windfirmness (BMPs 12.6, 12.6a). Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F4

Soils/Wetlands

Concern: Cable yarding across Vial Creek may damage soils. Kushnehin soils in Vial Creek buffer. Approximately 1 acre of wetland (0.2 acres on the east edge of the unit and 0.8 on the west edge).

Mitigation: Maintain full suspension across Vial Creek. No harvest on Kushnehin soils. F4

Wildlife/TES Plants

Concern: There are approximately 7 acres of high probability goshawk nesting habitat (see map).

Mitigation: Implement Forest-wide standards and guidelines if a goshawk nest is found. W1, W11

Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. Unit not seen from Alaska Marine Highway.

Mitigation: None needed.

Other Resources/Issues

Concern: Concern: Stand is in a wind-prone area. Blowdown along the edge is a concern.

Mitigation: Leave an irregular boundary on the east, west, and north edge to create a feathered effect. O1

Final Environmental Impact Statement

Skipping Cow Timber Sale

United States Department of Agriculture
Forest Service - Alaska Region

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Tongass National Forest
Petersburg Office

Responsible Official: Assistant Forest Supervisor
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Abstract:

This Final Environmental Impact Statement describes the effects of four "action" alternatives and one "no action" alternative for harvesting timber in the Skipping Cow Project Area.

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APPENDICES

Figures

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Summary

Summary

Introduction

This document outlines the effects of alternatives to a proposed timber sale on Zarembo Island known as the Skipping Cow Timber Sale. This document describes the "No Action" Alternative (Alternative 1), the "Proposed Action" (Alternative 3), and three alternative strategies for harvesting timber. The four action alternatives also include building and maintaining roads and maintaining log transfer facilities (LTFs). This Final Environmental Impact Statement (FEIS) discloses the environmental effects that are expected from the Proposed Action and each of the other alternatives, including the No Action Alternative.

Changes Between Draft and Final

- Harvest system for Units 5 and 6 has been changed to uneven-aged management with 75 percent retention of trees over 9 inches DBH for the lower third of these units.
- Volumes were updated to reflect changes in harvest system and right-of-way volume outside of the units was added.
- Road 52033 would be placed in storage under Option B and closed to all motorized access, enforced under a forest order.
- Berms would be installed rather than gates to close roads under Option B.
- Road management costs were updated.
- Areas suspected of having MMI4 soils were field-verified and properly classified (as MMI3).
- Additional information on LTFs is provided.
- Information on marine water environment was added.
- Geese timing restrictions have been eliminated.

Project Area

The Skipping Cow Project Area (Project Area) is located in Southeast Alaska on the south half of Zarembo Island, 10 miles west of the town of Wrangell, Alaska (see Figure 1-1 in Chapter 1). The approximately 25,740-acre Project Area includes the Nesbitt Creek and Vial Creek watersheds and the upper portions of the North and Middle Meter Bight Creek watersheds. The Tongass National Forest is divided into a common set of areas to facilitate resource inventory and interpretation. These areas, which generally encompass a drainage basin containing one or more large stream systems and follow easily recognizable watershed divides, are known as Value Comparison Units (VCUs). Portions of VCUs 457, 458, and 459 are included in the Planning Area. The Project Area is bordered to the east and to the west by medium old growth reserves.

Summary

Proposed Action

The Proposed Action for this project would harvest about 20 to 30 million board feet (MMBF) of sawlog and utility timber on approximately 900 to 1,300 acres in VCUs 457, 458, and 459. The Proposed Action is represented by Alternative 3. A cable harvest system would be used. Units are proposed to be clearcut, except for reserve trees. An existing LTF on the east side of Zarembo Island in Deep Bay Harbor is proposed to be used to transfer the logs to the water. Approximately 16 miles of system and temporary roads are proposed to be constructed. An existing log crib equipment off-loading bulkhead in Roosevelt Harbor is proposed to be reconstructed. This would be done to accommodate project equipment and the movement of materials and supplies.

Decision to be Made

The Record of Decision (ROD) for the Forest Plan established that timber harvest is appropriate in the Project Area. The Petersburg Office Assistant Forest Supervisor will decide: (1) if, where, and how much timber harvest should occur in the Project Area at this time; and if so, (2) where road development should occur to facilitate harvest; and (3) what mitigation measures and monitoring would be implemented.

Purpose and Need

The purpose and need for the Proposed Action is to respond to the goals and objectives identified by the Forest Plan for the timber resource while moving the Project Area towards the desired future condition for all resources. The reasons for scheduling a timber sale in this area at this time are discussed in Appendix A.

The Forest Plan identified the following goals and objectives:

1. Manage the Tongass timber resource for production of saw timber and other wood products from suitable timber lands made available for timber harvest, on an even-flow, long-term sustained yield basis and in an economically efficient manner (TLMP, 1997: page 2-4).
2. Seek to provide a timber supply sufficient to meet the annual market demand for Tongass National Forest timber, and the demand for the planning cycle (TLMP, 1997: page 2-4).
3. Maintain and promote industrial wood production from suitable timber lands, providing a continuous supply of wood to meet society's needs (TLMP, 1997: pages 3-135 and 3-144).
4. Produce desired resource values, products, and conditions in ways that also sustain the diversity and productivity of ecosystems (TLMP, 1997: page 2-1).
5. Help provide a diversity of opportunities for resource uses that contribute to the local and regional economies of Southeast Alaska.
6. Support a wide range of natural-resource employment opportunities within Southeast Alaska communities.

Public Scoping

"Public scoping" is the term used to describe the process of identifying the significant issues for a project by contacting interested individuals and agencies to determine their concerns. The following is a summary of the letters, contacts, and meetings that took place during the planning of this project:

- December 1997—Preliminary Scoping Letter to identify issues
- July 1998—Notice of Intent published in the Federal Register
- August 1998—Open House
- October 1998—Scoping Letter
- November 1998—Open House
- Meetings with individuals, agencies, and organizations, including the Alaska Department of Fish and Game (ADF&G), U.S. Fish and Wildlife Service (USFWS), and the Wrangell Cooperative Association
- September 1999—Open House and ANILCA 810 Subsistence Hearing
- October 1999—Field review of proposed Road 52033 with ADF&G
- January 2000—Open House (on road issues)

Issues

The following five key issues, which form the basis for the analysis of alternatives, were identified:

- Issue 1: Project Economics
- Issue 2: Road Access Management
- Issue 3: Wildlife Habitat
- Issue 4: Subsistence
- Issue 5: Wind Ecology

Alternatives Considered but Eliminated from Detailed Study

- **Large Clearcut Alternative:** This alternative would have responded to the concern about windthrow in the Project Area by mimicking a massive windthrow event.
- **Helicopter-only Alternative:** This alternative would have responded to the concern about road construction in currently unroaded areas by harvesting timber using a helicopter system from existing roads.
- **Old Growth Reserve Alternative:** This alternative would have accessed the upper Middle Meter Bight drainage via Road 52004 in the Round Point Old Growth Reserve. Road 52004 would have been extended to access the last remaining cable units in the drainage and then the road would have been decommissioned after the sale using timber sale funds.

Alternatives Considered in Detail

Alternative 1, No Action

Alternative 1, the No Action Alternative, analyzes the effects of not harvesting timber or building roads in the Project Area at this time (Figure 2-1 in Chapter 2).

Alternative 2

Alternative 2 responds to the issue of protecting wildlife by reducing the amount of clearcutting (Issue 3). This alternative would involve harvest of approximately 22.2 MMBF of timber from approximately 1,131 acres, plus 8 acres of right-of-way outside units. Approximately 167 acres would be helicopter yarded. The remainder would be cable yarded (Figure 2-2 and Table 2-1 in Chapter 2). Approximately 20 to 30 percent of the trees over 9 inches diameter at breast height (DBH) would be left in the units, in clumps, along backlines, and scattered throughout the units. The resulting stands would be managed as two-aged stands in order to provide structure for wildlife (Figure 2-2 and Table 2-1). Two road management options are considered: Option A would leave all roads open to motorized use. Option B would generally close new roads to public motorized use.

Alternative 3, Proposed Action

Alternative 3 (the Proposed Action) responds to the issue of timber economics by maximizing the amount of clearcutting and cable yarding (Issue 1). This alternative would involve harvest of approximately 24.5 MMBF of timber from approximately 1,110 acres plus 9 acres of right-of-way outside units. The harvest units would be the same as those in Alternative 2 except for Unit 12, which is not included. A cable harvest system would be used. The units would be clearcut, except for reserve trees. Approximately 10 percent of the trees over 9 inches DBH would be left within the units to provide wildlife habitat. The resulting stands would be managed as even-aged stands (Figure 2-3 and Table 2-2 in Chapter 2). Two road management options are considered: Option A would leave all roads open to motorized use. Option B would generally close new roads to public motorized use.

Alternative 4

Alternative 4 responds to the issue that road building and clearcutting may have an adverse effect on deer habitat and on long-term subsistence hunting in the Nesbitt drainage (Issues 3 and 4). No road building or clearcutting would occur in the Nesbitt Ridge area. Alternative 4 would harvest approximately 21.6 MMBF of timber from approximately 1,754 acres plus 2 acres of right-of-way outside units. Approximately 1,372 acres would be helicopter yarded and approximately 382 acres would be cable yarded (Figure 2-4 and Table 2-3 in Chapter 2). Two road management options are considered: Option A would leave

all roads open to motorized use. Option B would generally close new roads to public motorized use.

Alternative 5

Alternative 5 responds to Issue 5 (wind ecology) by starting harvest near the upper (leeward) end of the most windthrow-prone portion of the Nesbitt drainage with a single unit. This approach would lend itself to future harvest by advancing into the wind and reducing the amount of harvest-created edge exposed to the prevailing wind at any one time. This alternative responds to Issue 3 (wildlife habitat) and Issue 4 (subsistence) by minimizing the amount of road building and harvesting at this time in important deer winter range within the Nesbitt area. Instead of spreading the harvest along Nesbitt Ridge, as in the other action alternatives, this alternative would limit harvest to the top of the drainage. Two road management options are considered: Option A would leave all roads open to motorized use. Option B would generally close new roads to public motorized use.

Alternative 5 would harvest approximately 19.2 MMBF of timber from approximately 906 acres plus 5 acres of right-of-way outside units. The harvest units would be harvested using cable yarding systems. Most units would be clearcut, except for reserve trees. Approximately 10 percent of the trees over 9 inches DBH would be left within the units to provide wildlife habitat. The resulting stands would be managed as even-aged stands (Figure 2-5 and Table 2-4 in Chapter 2). The lower third of Units 5 and 6 would have no more than 25 percent of the trees over 9 inches DBH removed in order to protect important deer habitat. The resulting stands would be uneven-aged.

Mitigation Measures For All Action Alternatives

The mitigation measures for all of the action alternatives are described in Chapter 2 and Appendix D.

Comparison of Alternatives

Issue 1: Project Economics

Alternative 3 provides the highest timber volume, approximately 24.5 MMBF, and the highest net stumpage ($158/thousand board feet [MBF], at the high market analysis, $2/MBF, at the low market analysis, excluding system road costs). Alternative 2 provides the second highest volume, approximately 22.2 MMBF, but it has a poorer economic return ($95/MBF, high market, and a negative $61/MBF low market). Alternative 4 provides approximately 21.6 MMBF, and it has the second lowest net stumpage ($106/MBF, high market, and a negative $50/MBF, low market). Alternative 5 provides the lowest volume, approximately 19.2 MMBF, but it has the second highest net stumpage

($134/MBF, high market, and a negative $22/MBF, low market). Alternative 1, No Action, would not produce any timber volume.

Issue 2: Road Access Management

Alternative 1, No Action, would have the least adverse impacts to wildlife, including deer, but it would not improve access for timber management in the Project Area. It would not affect access for subsistence hunting.

Of the action alternatives, Alternative 3 would provide the best access for timber management, followed by Alternatives 5 and 2. Alternative 4 would provide the poorest access, requiring large areas suitable for cable yarding to be harvested using a helicopter. However, Alternative 4 would have the least impact on wildlife, followed by Alternatives 5 and 2. Alternative 3 would have the greatest impact.

There are two options for managing the roads proposed for construction for this project. Under Option A, all new system roads would remain open for public use. Under Option B, in all action alternatives, all new roads and approximately 1 mile of existing road would be closed to motorized access. It would be preferable because it would minimize adverse impacts to wildlife. Access for subsistence hunting would improve somewhat, since hunters could hike the closed roads and may access some areas using all-terrain vehicles (ATVs). The three subsistence hunters that testified at the ANILCA 810 hearing wanted the roads left open (Option A).

Issue 3: Wildlife Habitat

Alternative 1, No Action, would have the least effect on wildlife habitat.

Of the action alternatives, Alternative 4 would have the least adverse impact on old growth habitat and interior habitat (Table 2-5 in Chapter 2). It would also have the least impact on Endangered Species Act (ESA)-listed species, sensitive species, Management Indicator Species (MIS), and other species of interest because it would not build road into the Nesbitt and upper Middle Meter Bight drainages and because it would implement uneven-aged management in the Nesbitt area.

Alternative 3 would have the greatest impact on these resources and species because it has the greatest increase in new road construction and relies on even-aged management. Alternatives 5 and 2 are intermediate. Alternative 5 would not extend Road 52033 as far along Nesbitt Ridge and would not harvest important deer winter habitat in the Nesbitt area at this time. Alternative 2 would build the same road as Alternative 3 in the Nesbitt area, but would not include a new road into the upper Middle Meter Bight area. Also, Alternative 2 does not include any clearcutting. It implements two-aged management, leaving 20 to 30 percent of the trees over 9 inches DBH to provide wildlife habitat.

Issue 4: Subsistence

None of the alternatives would have a major effect on subsistence. Alternative 4, and, to a somewhat lesser extent, Alternative 5 would protect more deer winter range than Alternatives 2 and 3. This is expected to have a minor effect on the deer population, but it is expected to have little effect on subsistence hunting overall. The deer population is currently higher than the long-term carrying capacity that the Island can sustain if a series of harsh winters occur.

Subsistence hunters that gave testimony at the ANILCA 810 hearings held in Wrangell (August 9, 1999) supported keeping roads open to allow access to newly harvested areas for hunting and berry picking.

Issue 5: Wind Ecology

Alternative 1 would not result in an increased risk of windthrow over natural conditions at this time. Future timber sales would be likely to have similar effects as those described below. Alternative 5 is designed to respond to recent information on large-scale wind disturbance in the area. It would build less road into the wind-prone area west of Nesbitt Creek. One large unit (Unit 8), at the top of the area that has received catastrophic wind damage in the past, would be clearcut. Future units along Nesbitt Ridge would harvest into the wind. Therefore, the remaining forest would only have harvest-created "edge" in stream buffers and on the side protected from the prevailing wind. This alternative may have the greatest likelihood of preventing large-scale, harvest-caused windthrow. Alternative 4 would not build Road 52033 and Road 52034, reducing road-related windthrow. It would only remove 25 percent of the trees over 9 inches DBH in the wind-prone area west of Nesbitt Creek. This may have the effect of reducing windthrow, especially along the edges of the harvest units and in stream buffers compared to the other action alternatives. However, the remaining trees within the units would be subject to wind damage. Alternatives 2 and 3 would be more likely to induce harvest-related windthrow along the unit edges and in stream buffers. Although within-unit leave trees under Alternative 2 might lessen the edge effect, they would also be subject to windthrow.

A comparison of Alternatives 1 through 5 is provided on Table 2-5 in Chapter 2.

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Chapter 1

Purpose and Need

Chapter 1
Purpose and Need

Introduction

This Final Environmental Impact Statement (FEIS) was prepared for the Petersburg Office of the Tongass National Forest to document our efforts to make recommendations about a possible timber sale within the Skipping Cow Project Area (Project Area) based upon laws and other direction and upon public needs and concerns. The Assistant Forest Supervisor of the Petersburg Office, Tongass National Forest, will make the final decision, which will be documented in a Record of Decision (ROD).

This document outlines the effects of, and alternatives to, a proposed timber sale on Zarembo Island known as the Skipping Cow Timber Sale. This document describes the "No Action" Alternative (Alternative 1), the "Proposed Action" (Alternative 3), and three alternative strategies for harvesting timber. The action alternatives also include building and maintaining roads and maintaining log transfer facilities (LTFs). This EIS discloses the environmental effects and resource outputs that are expected from each of the alternatives.

This FEIS was prepared according to the format established by Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] 1500-1508). In general, the objective is to furnish enough site-specific information to demonstrate a reasoned consideration of the environmental impacts of the alternatives and how these impacts can be mitigated.

The planning record is available through the Wrangell Ranger District office in Wrangell, Alaska. Other reference documents such as the Forest Plan (TLMP, 1997; TLMP FEIS, 1997;and TLMP ROD, 1999), the Tongass Timber Reform Act (TTRA), the Resources Planning Act (RPA), and the Alaska Regional Guide are available at public libraries around the region as well as at the Assistant Forest Supervisor's Office in Petersburg, Alaska.

Document Organization

Chapter 1 provides the purpose and need for the proposed project, the public issues surrounding the action, and other introductory information. It also discusses how the Skipping Cow Timber Sale relates to the Forest Plan, the National Environmental Policy Act (NEPA), the key issues driving the EIS analysis, and the authorities guiding the EIS process.

Chapter 2 describes and compares the alternatives for the proposed activities. It includes summary information on their environmental impacts, implementation, and mitigation.

Chapter 3 describes the existing environment and predicts environmental effects likely to occur with implementation of the alternatives. These effects include both direct and indirect impacts of each alternative on the human and natural environment for each resource issue. Potential cumulative impacts of reasonably foreseeable or similar actions are also disclosed.

Chapter 4 contains the list of preparers, distribution list, glossary, index, and literature cited. The glossary will be especially useful to reviewers unfamiliar with technical terms or some of the more relevant laws regarding environmental analyses.

The appendices include supporting information on units, roads, monitoring, and project economics. Additional documentation may be found in the project planning record located through the Wrangell Ranger District Office in Wrangell, Alaska.

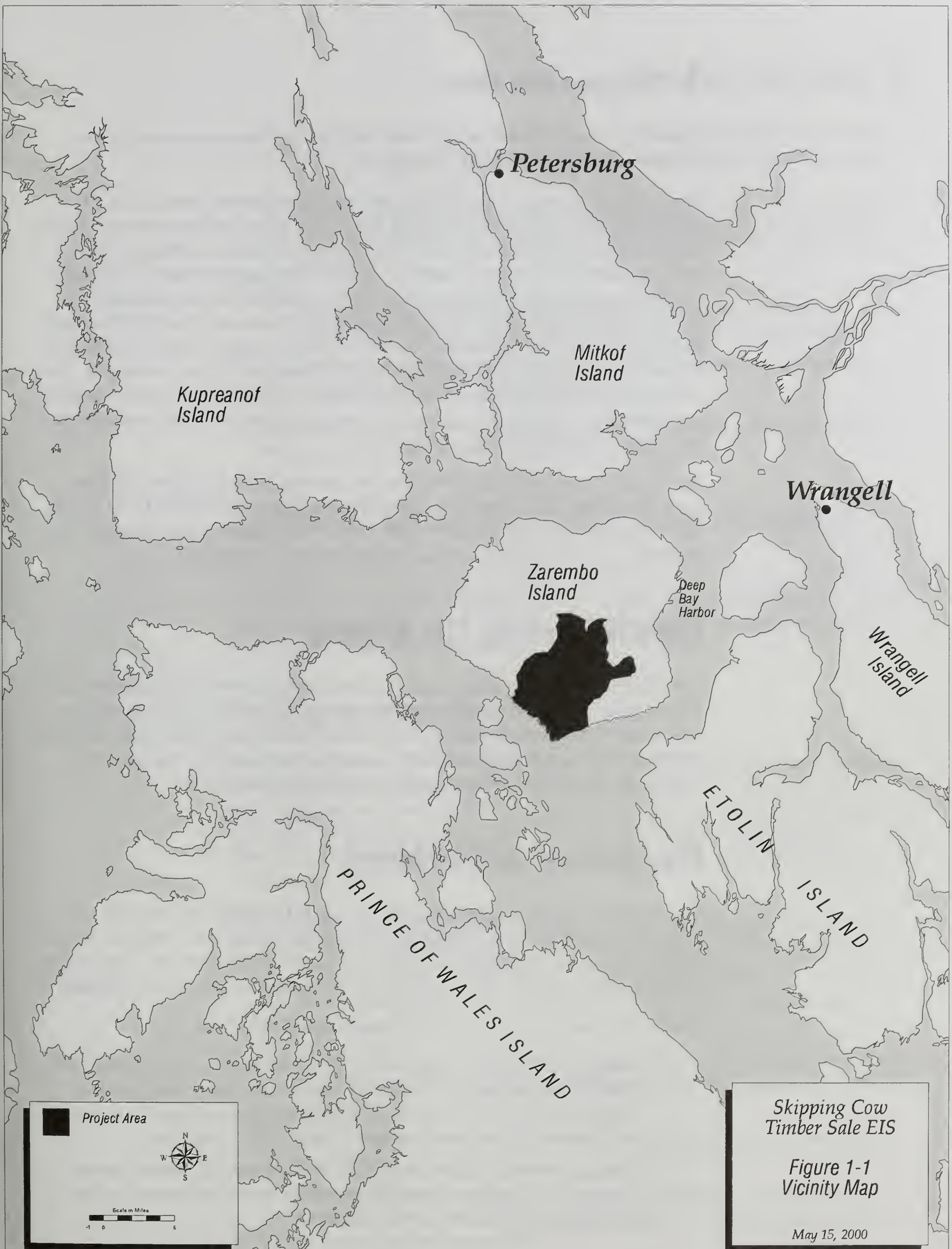
Project Area

The Project Area is located in Southeast Alaska on the southern half of Zarembo Island, 10 miles west of the town of Wrangell, Alaska (see Figure 1-1). The approximately 25,740 acre Project Area includes the Nesbitt Creek and Vial Creek watersheds and the upper portions of the North and Middle Meter Bight Creek watersheds. The Tongass National Forest is divided into a common set of areas to facilitate resource inventory and interpretation. These areas, which generally encompass a drainage basin containing one or more large stream systems and follow easily recognizable watershed divides, are known as Value Comparison Units (VCUs). Portions of VCUs 457, 458, and 459 are included in the Planning Area. A road system and two LTFs are located on the island.

The Project Area is bordered to the east and to the west by medium old growth reserves. These areas have an Old Growth Habitat Land Use Designation (LUD) that excludes programmed timber harvest.

Proposed Action

At the start of the planning process, we defined a Proposed Action. This serves as a starting point for the planning process, which initially involved identifying significant issues for the project by contacting interested individuals and agencies to determine their concerns. We then developed other alternatives to the Proposed Action in response to environmental issues, public concerns, and comments from other agencies. This process is described in more detail in



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Chapter 2. The Proposed Action could become, but does not have to be, the "preferred" or final "selected" alternative.

The original Proposed Action for this project would harvest about 20 to 30 million board feet (MMBF) of sawlog and utility timber on approximately 900 to 1,300 acres in VCUs 458 and 459. This has been refined into Alternative 3, which would harvest approximately 24.4 MMBF on approximately 1,110 acres. A cable harvest system would be used. Units would be clearcut, except for reserve trees. An existing LTF on the east side of Zarembo Island in Deep Bay Harbor would be used to transfer logs to the water. Approximately 16 miles of National Forest System and temporary roads would need to be constructed. An existing log crib equipment off-loading bulkhead in Roosevelt Harbor would be reconstructed. This would be done to accommodate project equipment and the movement of materials and supplies.

The log haul route on Road 6590, from the junction of Roads 6590 and 6594 (Mile Post [MP] 31.3) to the junction of Roads 6590 and 52000 (MP 22.3), and the log transfer access road 52001 (MP 0.0 to 0.4) would be reconditioned (including culvert replacement) and resurfaced prior to log haul.

Decision to be Made

The ROD for the Forest Plan established that timber harvest is appropriate in the Project Area. The Assistant Forest Supervisor will decide: (1) if, where, and how much timber harvest should occur in the Project Area at this time; and if so, (2) where road development should occur to facilitate harvest; and (3) what mitigation measures and monitoring would be implemented.

Purpose and Need

The purpose and need for the Proposed Action is to respond to the goals and objectives identified by the Forest Plan for the timber resource while moving the Project Area towards the desired future condition for all resources. The reasons for scheduling a timber sale in this area at this time are discussed in Appendix A.

The Forest Plan identified the following goals and objectives:

1. Manage the Tongass timber resource for production of saw timber and other wood products from suitable timber lands made available for timber harvest, on an even-flow, long-term sustained yield basis and in an economically efficient manner (TLMP, 1997: page 2-4).
2. Seek to provide a timber supply sufficient to meet the annual market demand for Tongass National Forest timber, and the demand for the planning cycle (TLMP, 1997: page 2-4).

3. Maintain and promote industrial wood production from suitable timber lands, providing a continuous supply of wood to meet society's needs (TLMP, 1997: pages 3-135 and 3-144).
4. Produce desired resource values, products, and conditions in ways that also sustain the diversity and productivity of ecosystems (TLMP, 1997: page 2-1).
5. Help provide a diversity of opportunities for resource uses that contribute to the local and regional economies of Southeast Alaska.
6. Support a wide range of natural-resource employment opportunities within Southeast Alaska communities.

The range of alternatives considered in this EIS was determined during our analysis and reflects issues raised during scoping.

Overall Direction for the Project

There are three LUDs within the Project Area: Timber Production, Scenic Viewshed, and Old Growth Habitat. There are also medium Old Growth Reserves on both sides of the Project Area. The following paragraphs provide an overview of the key elements of each LUD.

Timber Production

Nearly 97 percent of the Project Area has a LUD of Timber Production and falls into the southeastern part of VCU 458 and the southwestern part of VCU 459. All timber harvest units proposed under all of the alternatives lie entirely within the Timber Production LUD. Goals in the Forest Plan for management of Timber Production LUDs emphasize sustained, long-term timber production. Objectives include:

- Apply the Visual Quality Objective (VQO) of Modification in the foreground distance zone from Visual Priority Travel Routes and Use Areas. Apply Maximum Modification to all other areas.
- Locate and design timber harvest activities primarily to meet timber objectives.
- Maintain a spectrum of recreation and tourism opportunities consistent with the capabilities of the LUD and compatible with timber production objectives.
- Seek to reduce clearcutting when other cutting methods will meet land management objectives.
- Plan a transportation network of roads and helicopter access that will eventually access most of the suitable timber lands for standard logging or helicopter yarding systems.

Of the approximately 24,665 acres within the Timber Production LUD, approximately 8,750 acres are productive old growth forest.

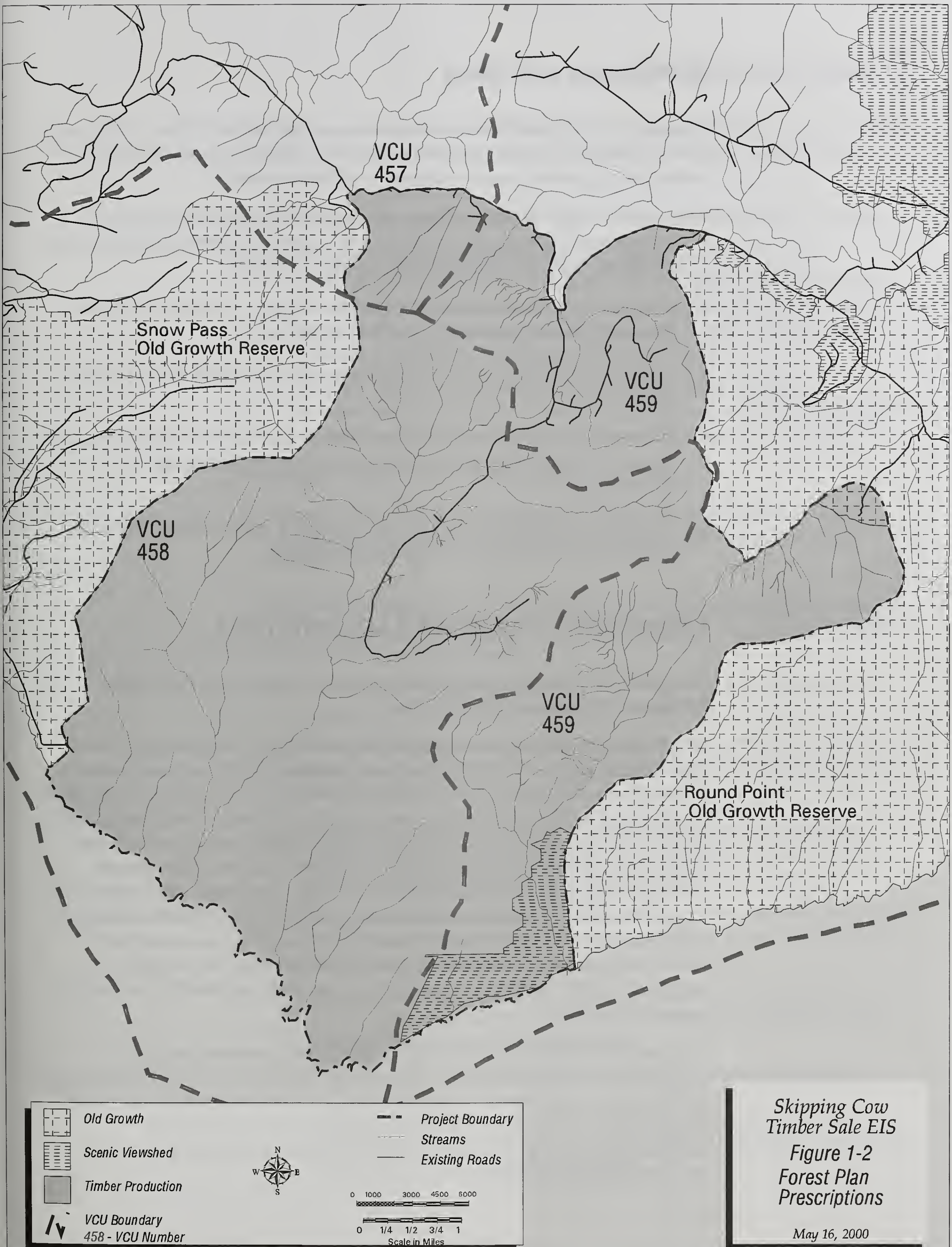
Scenic Viewshed

About 3 percent of the Project Area is designated as Scenic Viewshed (see Figure 1-2). This is in the lower Vial Creek area (Figure 3-11). No timber harvest units are proposed under any alternative within the Scenic Viewshed LUD. Goals in the Forest Plan for management of Scenic Viewshed LUDs are to provide a sustained yield of timber and a mix of resource activities while minimizing the visibility of developments. Objectives include:

- Apply the VQO of Retention in the foreground distance zone and Partial Retention in the middleground and background distance zones from Visual Priority Travel Routes and Use Areas. Apply Maximum Modification to all other areas.
- Suitable timber lands are available for timber harvest. Use appropriate silvicultural systems consistent with the adopted VQO.
- Perform viewshed analysis in conjunction with project development.
- Provide a spectrum of recreation and tourism opportunities consistent with the capabilities of the LUD. Semi-Primitive to Roaded experiences may be offered.
- Provide a transportation network compatible with the characteristic landscape.
- Extend rotations, as necessary, to meet the VQOs.

Old Growth Habitat

The Project Area is bordered on the west by a 14,450-acre Medium Old Growth Habitat LUD (Snow Pass Old Growth Reserve), which contains approximately 9,938 acres of productive old growth. It is bordered on the east by a 15,250-acre Medium Old Growth Habitat LUD (Round Point Old Growth Reserve), which contains approximately 7,797 acres of productive old growth. A small portion of the Round Point Old Growth Reserve (68 acres) is included in the Project Area (see Figure 1-2). This area was included in the Project Area because the original Proposed Action included extending Road 52004 through the Round Point Old Growth Reserve to access the upper Middle Meter Bight watershed. An alternate access route was identified during project planning and the route through the Old Growth Reserve is no longer being considered. No road construction or timber harvest units are proposed under any alternative within the Old Growth Habitat LUD. The Project Area boundary was not changed in order to maintain a consistent analysis base throughout the planning period.



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The goals in the Forest Plan for management of Old Growth Habitat LUDs are to maintain old-growth forest and their associated ecological processes to provide habitat for old-growth associated species. Objectives include:

- Provide old-growth forest habitats, in combination with other LUDs, to maintain viable populations of native and desired non-native fish and wildlife species that may be associated with old-growth species.
- Contribute to habitat capability of fish and wildlife resources to support sustainable human subsistence and recreational uses.
- Maintain biodiversity and ecological processes associated with old-growth forests.
- Allow previously harvested conifer stands to develop naturally to old-growth forest habitats or apply silvicultural prescriptions to accelerate forest succession.
- To the extent feasible, limit roads and permitted uses to those compatible with Old Growth Habitat management objectives.

Desired Future Condition

The Forest Plan describes the following desired condition for the Timber Production Management Prescription:

Suitable timber lands are managed for the production of sawtimber and other wood products on an even-flow, long-term sustained yield basis; the timber produced contributes to a Forest-wide sustained yield. An extensive road system provides access for timber management activities, recreation uses, hunting and fishing, and other public and administrative uses; some roads may be closed, either seasonally or year-long, to address resource concerns. Management activities will generally dominate most seen areas. Tree stands are healthy and in a balanced mix of age classes from young stands to trees of harvestable age, usually in 40 to 100 acre stands. Recreation opportunities associated with roaded settings, from Semi-primitive to Roaded Modified are available. A variety of wildlife habitats, predominantly in the early and middle successional stages, are present.

The desired conditions described by the Forest Plan provide a basis for management of the Project Area. Management activities will also be influenced by Forest Plan Standards and Guidelines (TLMP, 1997 as modified by TLMP ROD, 1999) and circumstances specific to the Project Area. Those circumstances include the adjacent old growth reserves and the subsistence needs of the local population.

The following desired conditions will guide the Forest Service's management of the Project Area in a manner consistent with the Forest Plan and the special circumstances of the area:

1. Soil productivity will be maintained while using the resources it produces.

    - Harvest timber on lands that are not adversely affected by the management activities. For example, harvest timber where the slopes are not overly steep, unless site-specific prescriptions indicate there is not a high risk of management-induced slope failure. Manage timber yarding to minimize disturbance on v-notch slopes.
    - Locate, construct, and maintain roads in ways that minimize environmental disturbance. Avoid locating roads in areas with unstable soils to prevent an increase in the potential for mass soil movement.

2. Aquatic productivity will be maintained or enhanced.

3. Maintain fish habitat, stream bank and stream channel processes, large woody debris supply, water quality, and fish passage through crossing structures.

    - Maintain balance between streamflow and sediment supplies to ensure long-term channel stability. Maintain streamflow regimes that support critical aquatic life stages.
    - Protect State-designated beneficial uses ("growth and propagation of fish, shellfish, other aquatic life, and wildlife").

4. Biologically important habitats will continue to be represented in the Project Area, so that a full spectrum of wildlife habitat needs is accounted for and landscape biodiversity is maintained.

    - Follow Forest Plan direction to maintain the long-term viability of wildlife populations by managing the size and shape of forest blocks, travel corridors between forest blocks, and migration pathways.
    - Maintain remnant patches of "old growth" in or adjacent to harvest areas to provide a seed source to eventually recolonize areas where forbs and shrubs have been shaded out by dense second growth.
    - Maintain subsistence resources by managing habitats and landscapes for game populations and by controlling access through minimizing road building and through road management.

5. Wind-prone areas will be managed to limit harvest-induced windthrow.

    - Maintain wind-prone stands by proper layout and design. Take advantage of recent research on wind ecology in Southeast Alaska when designing timber management activities.

6. 200-year rotation
   - No second growth will receive even-aged harvest until it reaches a minimum age of 200 years.
   - Harvest of the remaining old growth forest will be metered-out, as evenly as possible, over time until the second growth becomes available for intermediate treatments.

Public Involvement

When a timber sale project begins, a group of professionals with a variety of educational backgrounds are designated to an interdisciplinary team (IDT). The Skipping Cow IDT listened to public comment and worked with the public and various State and Federal agencies in an effort to plan the best possible project. The IDT conducted the planning process and wrote this document to inform the public and the Assistant Forest Supervisor of the environmental consequences of the Proposed Action and alternatives.

Public Scoping

"Public scoping" is the term used to describe the process of identifying the significant issues for a project by contacting interested individuals and agencies to determine their concerns. The following is a summary of the letters, contacts, and meetings that took place during the planning of this project:

- December 1997: Preliminary Scoping Letter to identify issues
- July 1998: Notice of Intent published in the Federal Register
- August 1998: Open House
- October 1998: Scoping Letter
- November 1998: Open House
- Meetings with individuals, agencies, and organizations, including the Alaska Department of Fish and Game (ADF&G), the U.S. Fish and Wildlife Service (USFWS), and Wrangell Cooperative Association
- September 1999—Open House and ANILCA 810 Subsistence Hearing
- October 1999—Field review of proposed Road 52033 with ADF&G
- January 2000—Open House (on road issues)

Other Agency Involvement—Permits, Licenses, and Certifications

Several other agencies reviewed this project and provided their professional input on topics in which they have expertise. In some cases, reviews are necessary because another agency has authority to issue permits for a specific activity we propose. Our relationship to other agencies in the planning of this project is described below.

U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers (Corps) is responsible for approving proposals to dredge or place fill materials in the coastal waters of the United States under Section 404 of the Clean Water Act. The Corps also has administrative authority over activities associated with wetlands. Any road construction in wetlands is of interest to the Corps and we must consider and reduce our effects on those areas. All roads proposed for this project are for the primary purpose of managing the timber resource.

U.S. Environmental Protection Agency

The U.S. Environmental Protection Agency (EPA) provides a general review in accordance with their responsibilities under NEPA, Section 309 of the Clean Air Act, and Section 402 of the Clean Water Act. They also administer permits associated with the LTFs under the National Pollution Discharge Elimination System.

National Marine Fisheries Service

The National Marine Fisheries Service (NMFS) has authority for threatened or endangered marine life and for all anadromous salmon. They are currently evaluating Essential Habitat for all salmon, including fresh water salmon. We consult with NMFS on possible effects on those species.

U.S. Fish and Wildlife Service

The USFWS administers the Endangered Species Act (ESA). We consult with the USFWS to determine if the proposed project would affect threatened or endangered species. Effects on other wildlife species are also discussed with the USFWS, since they have expertise in many areas and are interested in managing

wildlife in ways that will prevent the need for listing species as threatened or endangered in the future.

State of Alaska

Five departments in the State of Alaska were asked to participate in the planning of this project. They provided general comments and suggestions as well as specific reviews. These departments include:

1. Division of Governmental Coordination (DGC)—Provides overall coordination for the State's comments and administers the Alaska Coastal Management Program (ACMP), which requires the Forest Service to design activities compatible with approved State management guidelines.
2. Alaska Department of Environmental Conservation (ADEC)—Participates in cooperative water quality management through Section 319 of the Clean Water Act and a Memorandum of Agreement with the Forest Service. ADEC also issues a certificate of compliance with Alaska Water Quality Standards under Section 401 of the Clean Water Act.
3. Alaska Department of Fish and Game (ADF&G)—Involved in the Coastal Zone Consistency review and is especially interested in instream activities and other fish, water, wildlife, and subsistence issues.
4. Alaska Department of Natural Resources (ADNR)—Tideland permit and lease or easement necessary for the log transfer site.
5. State Historic Preservation Office (SHPO)—Compliance with Section 106 of the National Historic Preservation Act (NHPA), a process to determine the effects of alternatives on heritage resources.

Wrangell Cooperative Association

The Wrangell Cooperative Association is a federally recognized tribe. The Skipping Cow project is within the historic area used by the Tribe. We consult with the Tribe on projects such as Skipping Cow on a government to government basis.

Field Studies

Field studies were conducted in 1997, 1998, and 1999 to collect specific information relative to issues and to verify resource information contained in the Tongass National Forest geographic information system (GIS). Resource information maintained in the GIS includes streams, important wildlife habitat, timber and soil inventories, and locations of proposed harvest units. Unit pool cards were used to document the location of possible harvest units and roads. Resource specialists listed specific concerns on the cards and gave recommendations for addressing or mitigating those concerns (Appendices B and C). Information from field studies and GIS was then used to address the issues and analyze the environmental effects of each alternative. The Forest Service used the entire analysis to select a preferred alternative for publication in the FEIS.

Inventories, resource specialist reports, and GIS information are part of the Skipping Cow Timber Sale planning record. Also included in the planning record are the results of public scoping and the unit and road design cards. The planning record is available for public inspection through the Wrangell Ranger District office in Wrangell, Alaska.

Issues

Although there are often many potential issues and concerns associated with the planning of a timber sale, NEPA directs us to analyze in detail those issues that are significant. This ensures that the analysis and documentation are focused primarily on the issues that are most important to the specific Project Area and the decision to be made. We reviewed planning documents for other projects in the area and listened to comments during the public participation process. A cross-section of these comments is included in the margin adjacent to each issue. This information was used to identify five key issues, which form the basis for the analysis of alternatives. These key issues are discussed in the following paragraphs. Other concerns are discussed in the Resource Reports and summarized in Chapter 3.

"We are glad to see new jobs come to our area."

"...the proposed Skipping Cow project should be part of the transition towards a smaller-scale timber sale program tailored to southeast-based businesses."

Issue 1: Project Economics

The potential for the project to affect employment and the economy of local communities was brought up as an issue during public scoping. Public comments indicated concern about current changes in the timber industry. Comments ranged from voicing strong support for harvesting timber in the Project Area to questioning the need for the sale given recent mill closures in the area. The amount of wood harvested and any infrastructure developed with this entry may affect the amount of available timber and costs associated with future entries for timber harvest. Roads constructed for timber harvest may make

future sales more economical, but the access they provide between sales is a concern due to other issues, such as increased vulnerability of wildlife to hunting and other disturbances.

"Roads will not only make the sales more economical but will allow our citizens greater opportunities for hunting, camping, and other forms of recreation…"

"The Forest Service must fully examine how to minimize the impacts of roads."

Issue 2: Road Access Management

There is concern that Zarembo Island already has an extensive road system, and that these roads are expensive to maintain. There is also concern that these roads deliver sediment to streams for years after logging is completed. Roads increase hunting pressure on wildlife. Some commenters considered this a positive effect while others considered it a negative effect. Some looked forward to increased opportunity to hunt because of the improved access, others thought that the nature of the hunting experience would be degraded because more area would be roaded.

"Roads should be closed, water-barred after use. Zarembo has a high incidence rate of illegal ATV spot lighting during hunting season and roads should be securely closed to discourage this."

"Deer habitat and winter range bedding sites should be listed and avoided if possible."

Issue 3: Wildlife Habitat

The Forest Plan conservation biology strategy includes a system of Old Growth Reserves. How these reserves are connected with old growth corridors is also an important part of the strategy. The location and habitat quality of the corridors linking the Medium Old Growth Reserves east and west of the proposed timber sale units are important issues in the design of this timber sale.

Even with the Forest Plan conservation biology strategy, larger blocks of old growth outside the Old Growth Reserves system are still important for habitat function, such as in deer winter range, and areas of high use by certain species (goshawk, murrelets, wolves, etc.). The upper Nesbitt drainage has high use by deer. The Middle Meter Bight drainage has exhibited a higher use by marbled murrelets than adjacent drainages.

The location, density, and use of roads has an effect on the quality of wildlife habitat for certain species. Roads can act as a dispersal barrier to small mammals and amphibian populations. Roads would increase interior access to game animals. Road access has been identified as a concern for important species, such as wolves.

"ANILCA requires the Forest Service to evaluate the effect of its action on subsistence uses."

"Both VCU 458 and VCU 459 are important subsistence use areas for Wrangell residents."

Issue 4: Subsistence

Subsistence concerns are primarily related to deer production through time. In particular, as the lands on Zarembo Island available for timber production are fully developed with the associated road systems, how can basic roaded access be provided while meeting other land management objectives for deer production, deer predation, and water quality. This issue is also related to Issues 2 and 3.

Issue 5: Wind Ecology

Some portions of the Project Area have received catastrophic disturbance from wind storms in the past. Much of the forest in the Nesbitt Creek area originated after a wind storm blew down the existing forest approximately 250 years ago. Harvesting 40 to 100 acre patches of forest now may result in increasing the risk of blowdown to adjacent forest. How can the Forest Service capitalize on its knowledge of the ecology of the area and past events to reduce the risk of catastrophic blowdown?

Other Environmental Considerations

Other resource concerns are important, but were not used to drive alternative development. These resources are protected to such a degree by the Forest Plan Standards and Guidelines, and by other laws and constraints, that the effects from each of the alternatives are not significant. A more detailed discussion of these important resources and the protection measures used for them can be found in the Resource Reports and is summarized in Chapter 3.

Issues considered as part of this analysis, which do not appear to be significant, include:

- Fish Habitat
- Water Quality
- Wetlands
- Vegetation
- Visual Resources
- Roadless
- Recreation
- Heritage Resources
- Air Quality
- Effects on Consumers, Civil Rights, and Women

Legislation and Executive Orders Related to this EIS

A brief list of laws pertaining to preparation of EISs on Federal lands is shown below. Some of these laws are specific to Alaska, while others pertain to all Federal lands.

- Multiple Use Sustained Yield Act of 1960
- National Historic Preservation Act (NHPA) of 1966 (as amended)
- Wild and Scenic Rivers Act of 1968, amended 1986
- National Environmental Policy Act (NEPA) of 1969 (as amended)
- Clean Air Act of 1970 (as amended)
- Alaska Native Claims Settlement Act (ANCSA) of 1971
- Marine Mammal Protection Act of 1972
- Endangered Species Act (ESA) of 1973 (as amended)
- Forest and Rangeland Renewable Resources Planning Act (RPA) of 1974 (as amended)
- National Forest Management Act (NFMA) of 1976 (as amended)
- Clean Water Act of 1977 (as amended)
- American Indian Religious Freedom Act of 1978
- Alaska Native Interest Lands Conservation Act (ANILCA) of 1980
- Archeological Resource Protection Act of 1980
- Cave Resource Protection Act of 1988
- Tongass Timber Reform Act (TTRA) of 1990
- Magnuson-Stevens Fishery Conservation and Management Act of 1996
- Executive Order 11988 (floodplains)
- Executive Order 11990 (wetlands)
- Executive Order 11593 (heritage)
- Executive Order 12898 (environmental justice)
- Executive Order 12962 (aquatic systems and recreational fisheries)

In addition, the Coastal Zone Management Act (CZMA) of 1976, as amended, pertains to the preparation of this EIS. Federal lands are not included in the definition of the coastal zone as prescribed in the CZMA. However, the CZMA requires that when federal agencies conduct activities or developments that affect the coastal zone, that agency's activities or developments must be consistent to the maximum extent practicable with the approved State Coastal Management Program. This determination is made by the Forest Service.

The Alaska Coastal Management Plan incorporated the Alaska Forest Resources and Practices Act of 1979 as applied standards and guidelines for timber harvesting and processing. The Forest Service Standards and Guidelines and Mitigation Measures described in Chapter 2 of this document equal or exceed State standards.

A Civil Rights Impact Analysis (CRIA) is used to identify any possible impacts associated with a proposed project based on an individual's civil rights (religion, race, color, national origin, age, gender, disability, marital status, or political beliefs). If you feel this project will impact your civil rights, please let us know. This analysis tiers to the Economic and Social Environment analysis included in Chapter 3 of the Forest Plan FEIS (TLMP FEIS, 1997).

Availability of the Planning Record

An important consideration in the preparation of this EIS has been the reduction of paperwork as specified in 40 CFR 1500.4. In general, the objective is to furnish enough site-specific information to demonstrate a reasoned consideration of the environmental impacts of the alternatives and how these impacts can be mitigated.

The planning record is a comprehensive project file documenting the process of developing this EIS, and is located through the Wrangell Ranger District Office in Wrangell, Alaska. Other reference documents such as the Forest Plan, the Tongass Timber Reform Act, the Resources Planning Act, and the Alaska Regional Guide are available at public libraries around the region as well as at the Assistant Forest Supervisor's Office in Petersburg and Sitka, and the Forest Supervisor's Office in Ketchikan, Alaska. The Forest Plan is also available on the Internet and CD-ROM.

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Chapter 2

Alternatives

Chapter 2
Alternatives

Introduction

This chapter describes the process used to develop alternatives to the Proposed Action. We describe the alternatives that we studied in detail, summarize those we dropped, identify mitigation measures, and briefly compare alternatives.

Changes Between Draft and Final

- Harvest system for Units 5 and 6 has been changed to uneven-aged management with 75 percent retention of trees over 9 inches DBH for the lower third of these units.
- Volumes were updated to reflect changes in harvest system and right-of-way volume outside of the units was added.
- Road 52033 would be placed in storage under Option B and closed to all motorized access, enforced under a forest order.
- Berms would be installed rather than gates to close roads under Option B.
- Road management costs were updated.
- Areas suspected of having MMI4 soils were field-verified and properly classified (as MMI3).
- Additional information on LTFs is provided.
- Information on marine water environment was added.
- Geese timing restrictions have been eliminated.

Alternative Development

The Proposed Action (Alternative 3) is one of many possible approaches to harvesting timber in the Project Area. It was developed during the early planning phase of this project. The planning phase included completing a logging system and transportation analysis for the Project Area. Based on this analysis, the suitable timber in the Project Area was divided into logical harvest units. This group of units is called the unit pool and is described in the Vegetation and Timber Resources section in Chapter 3. These units and the proposed road system

were surveyed in 1997 and 1998, and reviewed in 1999. An alternate route that would not require road building or hauling through the old growth reserve was identified during field reconnaissance. Alternative 3 was modified to include this route (Road 52034). Preliminary scoping was completed in 1998.

This chapter describes the Proposed Action and three other action alternatives plus a No Action Alternative. These alternatives were developed to address the Purpose and Need for the project; to meet Forest Plan Standards and Guidelines (TLMP, 1997 as modified by TLMP ROD, 1999) and applicable laws; and to respond to the key issues that were identified during our public involvement process. Different alternatives address the different key issues to varying degrees, depending on the theme of the alternative. All alternatives are consistent with the Forest Plan.

Various combinations of elements in Alternatives 2 through 5 are possible. For example, it is possible to consider an alternative that combines the helicopter yarding system proposed in Alternative 4 with the clearcut harvest system of Alternative 5 in the Nesbitt area. The alternatives presented in this document are intended to provide a reasonable range of options in order to achieve the purpose of the project. Within this range, various combinations of alternatives can be considered in determining the selected alternative.

There are two options for managing the roads proposed for construction for this project. Under Option A, all new system roads would remain open for public motorized use. Under Option B, in all action alternatives, all new roads and approximately 1 mile of existing road would be closed to motorized access.

Forest Plan Consistency

On April 13, 1999, the Deputy Under Secretary of Agriculture, James Lyons, signed a new Record of Decision (ROD) for the Tongass Land Management Plan. This ROD contained modifications to the 1997 Forest Plan. This ROD became effective on October 1, 1999 (Appendix A).

The alternatives incorporate all applicable management direction from the 1997 Forest Plan, as modified by the 1999 ROD and are fully consistent with its goals and objectives, Standards and Guidelines, and management area prescriptions as they apply to the Project Area.

Alternatives Considered But Eliminated From Detailed Study

Large Clearcut Alternative

An alternative was considered that would have responded to the concern about windthrow in the Project Area by mimicking a massive windthrow event. The area along the edge of clearcuts is often adversely affected by windthrow following harvest. Four 50-acre units can have much more total edge than one 200-acre unit. This alternative proposed harvesting much of the area west of Nesbitt Creek and some of the upper portion of the Vial Creek drainage in 2 to 3 very large harvest units. This would reduce the amount of edge subject to windthrow. This alternative was eliminated because of potential adverse effects on water quality, fish habitat, and wildlife that very large harvest units might cause. Regional Forester approval would have been required for clearcut units over 100 acres.

Helicopter-only Alternative

A helicopter-only alternative was considered that would have responded to the concern about road construction in currently unroaded areas. This alternative would have emphasized wildlife habitat protection, especially security habitat, and water quality. This alternative would not have provided increased access for future timber sales, either roaded or helicopter. There is an economic limit to the distance from roads that helicopters can haul logs. This limit is approximately one mile. Without the additional roads, much of the suitable timber in the planning area would be isolated and too expensive to harvest. The decision maker preferred to expand the road network at this time in order to enhance the economic viability of this sale and future sales. Since there would be low road construction costs associated with future sales, cable ground and some isolated timber could be harvested in order to meet Timber LUD goals while providing a sale that would be more attractive to buyers. The helicopter logging option for the Nesbitt Creek area is included in Alternative 4. The helicopter logging option for the Middle Meter Bight Creek area is included in both Alternatives 2 and 4.

Old Growth Reserve Road Alternative

This alternative would have accessed the upper Middle Meter Bight drainage via Road 52004 in the Round Point Medium Old Growth Reserve. Road 52004 would have been extended to access the cable units in the upper portion of the drainage. The road would have been decommissioned after the sale using timber sale funds (see page 23 for definition). Roads 52004 and 6597, which are in the old growth reserve, would be used to haul the timber harvested in the Middle Meter Bight drainage to the log transfer site. These roads would also be decommissioned after the sale using timber sale funds. This alternative was eliminated after an alternate route, which did not require road building or hauling through the old growth reserve, was identified during field reconnaissance. Roads 52004, 6598, and most of 6597, which are in the Round Point Old Growth Reserve, were decommissioned in 1999.

Alternatives Considered in Detail

Best Management Practices (BMPs) are practices and operating procedures designed to protect water quality and wetlands. They are the result of extensive efforts between the Forest Service and the State of Alaska to identify practices that will ensure that timber harvest activities minimize soil erosion and protect aquatic habitat.

BMPs are standards to be achieved, not detailed or site-specific prescriptions or solutions. As defined in the USDA Forest Service's Soil and Water Conservation Handbook, BMPs are mandated for use in Region 10 under the Tongass Timber Reform Act.

Road Management Options:

- *Road Storage*
- *Decommissioned or Closed (ADNR definition)*
- *Maintenance*
- *Stormproofing*

Items Common to All Alternatives

Best management practices (BMPs) would be applied to all road location, design, and construction, as well as in timber harvest units. Riparian management areas would be protected with no-harvest buffers, as described in the riparian standards and guidelines of the Forest Plan.

A slope stability assessment has been completed for any units that contain slopes greater than 72 percent.

Forest Plan management guidelines are to avoid roads on slopes greater than 67 percent where feasible (TLMP, 1997). Roads in the Project Area are generally on less than 67 percent slopes and site-specific BMPs would be applied where short sections of steep slopes are unavoidable. These include full-bench construction and end-hauling of any cut material to reduce the risk of road failure. The road cards in Appendix B provide additional details.

All action alternatives recondition Roads 6590 and 52001 and reconstruct the equipment off-loading bulkhead in Roosevelt Harbor. Road 6590 from the junction of Roads 6590 and 6594 (MP 31.3) to the junction of Roads 6590 and 52000 (MP 22.3) would be reconditioned. The log transfer access road, Road 52001 (MP 0.0 to 0.3), would be reconditioned.

Existing system roads that are currently open would remain open. Two road management options are proposed. The effects of these alternative approaches to road management are discussed in Chapter 3 (Issue 2).

Temporary roads would be closed and natural drainage patterns would be restored.

All alternatives would be managed under a 200-year rotation to emphasize deer habitat capability in the Project Area.

Retain at least 5 trees over approximately 24 inches DBH per acre (actual DBH will be determined based on cruise data) in Units 12 through 15 to enhance future marbled murrelet habitat. Operations would be avoided between April 1 and June 15 to limit impacts to sandhill cranes in the southern one-third of Units 5 and 7, and between May 1 and June 15 to protect marbled murrelets in Units 12 through 15.

Harvest would not take place within 600 feet of an active raptor or marbled murrelet nest. Unit 24 was designed to exclude a 600-foot buffer around a sharp-shinned hawk nest. No other nests have been found in or near harvest units.

The following road management strategies are considered in each action alternative: keeping roads open with appropriate maintenance level, road storage, and stormproofing. These terms are explained in the sidebar.

Cull logs would be left in units to provide structure and habitat for wildlife and to maintain adequate levels of large woody debris (LWD).

Wetlands would be avoided as much as practicable. No developments are planned in biologically significant wetlands within the Project Area, including fens, estuarine wetlands, or lake-fringe wetlands. Under all alternatives, roads and harvest units would be located to avoid impacts to these areas.

Heritage resources located prior to or during the timber sale would be protected. Appropriate mitigation measures would be designed in consultation with the Alaska State Historic Preservation Office. (Archeological surveys do not indicate that any known sites would be affected by the alternatives as currently designed.)

All alternatives include a wildlife corridor that links the medium old growth reserves east and west of the Project Area (Figures 3-1 to 3-5 in Chapter 3).

> ***Road Storage:***
> Process of putting a road into a closed condition which protects resources including soils, water quality, fisheries, and wildlife. These roads may be left in this condition for many years. The road remains on the forest road transportation inventory and will be reopened at a future date.
>
> ***Three Steps of Storage:***
> 1. *Establishing drainages across the roadway that are self-maintaining and that effectively prevent erosion.*
> 2. *Removing culverts and bridges and reestablishing the natural drainage patterns of streams and bypassing ditch relief culverts with waterbars.*
> 3. *Returning the roadway to resource production through natural or planted vegetation (grass, browse, or trees).*

> ***Decommissioning:***
> *Same minimum requirements as for Storage, except that the road is removed from the forest road transportation inventory. There are no plans to reopen the roads that have been decommissioned.*

> ***Stormproofing:***
> *Leave drainage structures in place, but provide waterbars, rolling dips, outslopes, and other features to ensure controlled runoff until any needed maintenance can be performed on the primary drainage system.*

> ***Maintenance:***
> *Maintain the road to the standard assigned for the maintenance level of the road.*

Alternative 1, No Action

In this alternative, we analyze the effects of not harvesting timber or building roads in the Project Area at this time. This alternative would respond to the issues of subsistence and wildlife habitat protection, including old growth forests, and protecting watershed conditions by not building more roads or harvesting timber. However, this alternative would not respond to the issue of providing employment and contributing to the local economy. This alternative would not contribute sawtimber or other wood products to meet the annual demand for Tongass National Forest timber from the Project Area, as described in the Purpose and Need (Chapter 1).

No roads would be built as part of this project. This alternative would not contribute to local timber-resource-related employment or income, and would not move the Project Area towards the desired future condition described in the Forest Plan (TLMP, 1997). The existing condition would continue to be influenced by

natural disturbance processes (Figure 2-1). The No Action Alternative provides a benchmark that allows the decision-maker to compare the magnitude of the environmental effects of the action alternatives with the current condition (CEQ Regulations, Section 1502.14[c]).

Alternative 2

Alternative 2 responds to the issue of protecting wildlife habitat by reducing the amount of clearcutting. Between 20 to 30 percent of the trees greater than 9 inches diameter at breast height (DBH) would be left to provide structure for wildlife in every unit.

This alternative would involve harvest of approximately 22.2 MMBF of timber from approximately 1,131 acres plus 8 acres of right-of-way outside of units. Approximately 167 acres would be helicopter yarded. The remainder (964 acres) would be cable yarded (Figure 2-2 and Table 2-1). Approximately 20 to 30 percent of the trees over 9 inches DBH would be left in the units, in clumps, along backlines, and scattered throughout the units. The resulting stands would be managed as two-aged stands in order to provide structure for wildlife.

This alternative would extend the Mustang Lake Road approximately 2.4 miles along the west side of Vial Creek (Road 6594). Alternative 2 would also build approximately 5.4 miles of system road along Nesbitt Ridge (Road 52033) and approximately 1.8 miles along Mustang Ridge (Road 52032). Cable units would be harvested along these roads (Figure 2-2). It would also build approximately 3.5 miles of temporary roads.

Table 2-1
Alternative 2: Two-aged Management (Harvest 70 to 80 Percent of Trees over 9 Inches DBH)

Unit	Unit Acres	Yarding Method	Harvest System	Harvest Volume[1/] (MBF)
1	62	Cable	Two-aged	1,408
2	75	Cable	Two-aged	1,557
3	7	Cable	Two-aged	80
4	7	Cable	Two-aged	60
5	63	Cable	Two-aged	1,312
6	83	Cable	Two-aged	1,374
8	40	Cable	Two-aged	1,175
9	97	Cable	Two-aged	2,725
10	88	Cable	Two-aged	1,609
11	75	Cable	Two-aged	928
12	21	Helicopter	Two-aged	396
13	36	Helicopter	Two-aged	736
14	10	Helicopter	Two-aged	217
15	24	Helicopter	Two-aged	554
16	27	Helicopter	Two-aged	417
17	11	Helicopter	Two-aged	207
18	100	Cable/Helicopter	Two-aged	1,989
19	25	Cable	Two-aged	396
20	46	Cable	Two-aged	875
21	29	Cable	Two-aged	551
22	11	Cable	Two-aged	205
23	33	Cable	Two-aged	654
24	48	Cable	Two-aged	704
25	92	Cable	Two-aged	1,608
26	21	Cable	Two-aged	334
Subtotal	**1,131**			**22,071**
Right-of-way volume outside of units				160
TOTAL				**22,231**

[1/]Includes sawlog and utility.
DBH = diameter at breast height MBF = thousand board feet

Alternative 3, Proposed Action

Alternative 3 (the Proposed Action) responds to the issue of timber economics by maximizing the amount of clearcutting and cable yarding. This alternative would involve harvesting approximately 24.5 MMBF of timber from approximately 1,110 acres plus 9 acres of right-of-way outside of units. The harvest units would be the same as those in Alternative 2 except for Unit 12, which is not included (Figure 2-3 and Table 2-2). A cable harvest system would be used. The units would be clearcut, except for reserve trees. Approximately 10 percent of the trees over 9 inches DBH would be left within the units to provide wildlife habitat. The resulting stands would be managed as even-aged stands.

Table 2-2
Alternative 3: Even-aged Management (Clearcut with Reserve Trees)

		Yarding	Harvest	Total Harvest Volume[1/]
1	62	Cable	Even-aged	1,584
2	75	Cable	Even-aged	1,752
3	7	Cable	Even-aged	90
4	7	Cable	Even-aged	68
5	63	Cable	Even-aged	1,476
6	83	Cable	Even-aged	1,547
8	40	Cable	Even-aged	1,321
9	97	Cable	Even-aged	3,066
10	88	Cable	Even-aged	1,810
11	75	Cable	Even-aged	1,044
13	36	Cable	Even-aged	830
14	10	Cable	Even-aged	244
15	24	Cable	Even-aged	624
16	27	Cable	Even-aged	469
17	11	Cable	Even-aged	233
18	100	Cable	Even-aged	2,237
19	25	Cable	Even-aged	446
20	46	Cable	Even-aged	983
21	29	Cable	Even-aged	619
22	11	Cable	Even-aged	230
23	33	Cable	Even-aged	736
24	48	Cable	Even-aged	792
25	92	Cable	Even-aged	1,809
26	21	Cable	Even-aged	375
Subtotal	**1,110**			**24,385**
Right-of-way volume outside of units				180
TOTAL				**24,465**

[1/]Includes sawlog and utility.
MBF = thousand board feet

As in Alternative 2, Alternative 3 would extend the Mustang Lake Road approximately 2.4 miles along the ridge west of Vial Creek (Road 6594) and would build about 5.4 miles of system road along Nesbitt Ridge (Road 52033) and approximately 1.8 miles along Mustang Ridge (Road 52032). In addition, Alternative 3 would build approximately 2.2 miles in the upper Middle Meter Bight drainage (Road 52034). Cable units would be harvested along these roads (Figure 2-3). It would also build approximately 4.4 miles of temporary roads.

Alternative 4

This alternative responds to the issue that road building and clearcutting may have an adverse effect on deer habitat and on long-term subsistence hunting in the Nesbitt drainage (Issues 3 and 4). This alternative responds to the issue of windthrow through the use of partial cuts in the Nesbitt Ridge area. Alternative 4 would harvest approximately 21.6 MMBF of timber from about 1,754 acres plus 2

acres of right-of-way outside of units (Figure 2-4 and Table 2-3). Approximately 1,372 acres would be helicopter yarded and approximately 382 acres would be cable yarded.

Three silvicultural systems (or harvest methods) would be implemented. These methods are discussed in the Vegetation and Timber Resources Section and displayed on Figure 2-4 and Table 2-3. Approximately 449 acres would be managed as even-aged stands, they would be clearcut except for reserve trees. Approximately 296 acres would be managed as two-aged stands, 70 to 80 percent of the trees over 9 inches DBH would be harvested. The remaining areas, approximately 1,009 acres, would be managed as uneven-aged stands, approximately 25 percent of the trees over 9 inches DBH would be harvested.

Table 2-3
Alternative 4: Combination of Even-aged, Two-aged, and Uneven-aged Management[1/]

			Harvest	Harvest Volume[2/]
1	62	Cable/Helicopter	Even/Two-aged	1,496
2	75	Helicopter	Two-aged	1,557
3	7	Cable	Even-aged	90
4	7	Cable	Even-aged	68
5	63	Helicopter	Uneven-aged	410
6	83	Helicopter	Uneven-aged	430
7	123	Helicopter	Uneven-aged	1,187
8	111	Helicopter	Uneven-aged	905
9	214	Helicopter	Uneven-aged	1,600
10	144	Helicopter	Uneven-aged	785
11	271	Helicopter	Uneven-aged	1,322
12	21	Helicopter	Two-aged	396
13	36	Helicopter	Two-aged	736
14	10	Helicopter	Two-aged	217
15	24	Helicopter	Two-aged	554
16	27	Helicopter	Two-aged	417
17	11	Helicopter	Two-aged	207
18	100	Cable/Helicopter	Even-aged	2,237
19	25	Cable	Even-aged	446
20	46	Cable	Even-aged	983
21	29	Cable	Even-aged	619
22	11	Cable	Even-aged	230
23	33	Cable	Even-aged	736
24	48	Cable	Even-aged	792
25	92	Cable	Even-aged	1,809
26	81	Cable/Helicopter	Even/Two-aged	1,346
Subtotal	**1,754**			**21,575**
Right-of-way volume outside of units				44
TOTAL				**21,619**

[1/]Even-aged = Clearcut with reserve trees (remove 90% of the trees over 9 inches DBH); Two-aged = Remove 70 to 80% of the trees over 9 inches DBH; Uneven-aged = Remove 25% of the trees over 9 inches DBH

[2/] Includes sawlog and utility.

MBF = thousand board feet

This alternative would not extend the road along Nesbitt Ridge (Road 52033). Much of the area on the west side of Nesbitt Creek would be helicopter yarded. Approximately 25 percent of the trees over 9 inches DBH would be harvested in Units 5 to 11. Diameter limit harvests would target specific diameter classes of trees to be harvested. Tree removal would be scattered throughout the stand. The goal would be to gradually harvest the stand over time, in a manner that minimizes harvest related windthrow. This, and future entries, would result in stands that are a mosaic of different age classes.

As in Alternatives 2 and 3, Alternative 4 would extend the Mustang Lake Road approximately 2.4 miles along the ridge west of Vial Creek (Road 6594) and would build approximately 1.8 miles of road along Mustang Ridge (Road 52032). Cable units would be harvested along these roads (Figure 2-4). Alternative 4 would also build approximately 1.4 miles of temporary roads. No new roads would be built along Nesbitt Ridge or into the Middle Meter Bight drainage.

Alternative 5

This alternative responds to Issue 5 (wind ecology) by starting harvest near the upper (leeward) end of the most windthrow-prone portion of the Nesbitt drainage with a single unit. This approach would lend itself to future harvest by advancing into the wind and reducing the amount of harvest-created edge exposed to the prevailing wind at any one time.

This alternative responds to Issue 3 (wildlife habitat) and Issue 4 (subsistence) by minimizing new roads and harvesting at this time in important deer habitat in the Nesbitt area. Instead of spreading the harvest along Nesbitt Ridge, as in the other action alternatives, this alternative would limit harvest to the top of the drainage.

Alternative 5 would harvest approximately 19.2 MMBF of timber from approximately 906 acres plus 5 acres of right-of-way outside units (Figure 2-5 and Table 2-4). The harvest units would be harvested using cable yarding systems. Most units would be clearcut, except for reserve trees. Approximately 10 percent of the trees over 9 inches DBH would be left within the units to provide wildlife habitat. The resulting stands would be managed as even-aged stands. The lower third of the slope of Units 5 and 6 would have no more than 25 percent of the trees over 9 inches DBH removed in order to protect important deer habitat. The resulting stands would be uneven-aged.

As in Alternative 3, Alternative 5 would extend the Mustang Lake Road approximately 2.4 miles along the ridge west of Vial Creek (Road 6594). It would build approximately 1.8 miles along Mustang Ridge (Road 52032) and approximately 2.2 miles in the upper Middle Meter Bight drainage (Road 52034). However, Alternative 5 would build approximately 3.9 miles of system road along Nesbitt Ridge (Road 52033) rather than 5.4 as in Alternatives 2 and 3. Cable units

would be harvested along these roads (Figure 2-5). It would also build approximately 3.9 miles of temporary roads.

Table 2-4
Alternative 5: Primarily Even-aged Management (Clearcut with Reserve Trees)

Unit	Unit Acres	Harvest System[1/]	Yarding Method	Harvest Volume[2/] (MBF)
1	62	Even-aged	Cable	1,584
2	75	Even-aged	Cable	1,752
3	7	Even-aged	Cable	90
4	7	Even-aged	Cable	68
5	63	Even-aged upper 2/3 Uneven-aged lower 1/3	Cable	853
6	83	Even-aged upper 2/3 Uneven-aged lower 1/3	Cable	1,134
8	95	Even-aged	Cable	2,960
13	36	Even-aged	Cable	830
14	10	Even-aged	Cable	244
15	24	Even-aged	Cable	624
16	27	Even-aged	Cable	469
17	11	Even-aged	Cable	233
18	100	Even-aged	Cable	2,237
19	25	Even-aged	Cable	446
20	46	Even-aged	Cable	983
21	29	Even-aged	Cable	619
22	11	Even-aged	Cable	230
23	33	Even-aged	Cable	736
24	48	Even-aged	Cable	792
25	92	Even-aged	Cable	1,809
26	21	Even-aged	Cable	375
Subtotal	**906**			**19,068**
Right-of-way volume outside of units				109
TOTAL				**19,187**

[1/] Even-aged = Clearcut with reserve trees (remove 90% of the trees over 9 inches DBH); Two-aged = Remove 70 to 80% of the trees over 9 inches DBH; Uneven-aged = Remove 25% of the trees over 9 inches DBH

[2/] Includes sawlog and utility.

MBF = thousand board feet

Mitigation Measures

The analysis documented in this EIS discloses the possible adverse impacts that may occur as a result of implementing the actions proposed. Therefore, measures were formulated to mitigate these impacts. These measures were guided by the Forest Service goals and objectives for the applicable LUDs and follow the Forest Plan Standards and Guidelines (TLMP, 1997).

A variety of site-specific mitigation measures designed primarily to avoid or minimize adverse impacts have been evaluated, and those that are most

appropriate have been incorporated into harvest unit and road design. These measures are summarized in the following subsections and are referenced on the unit cards and road cards (Appendices B and C). In addition, Appendix D lists each site-specific mitigation measure and the unit and alternative to which it applies.

In addition to the site-specific measures listed below, a variety of other site-specific measures would apply to all harvest and construction activities and would be incorporated into the timber harvest unit and road design. These include all appropriate BMPs not specifically identified below. Direction for use of BMPs on National Forest System lands in Alaska is included in Chapter 10 of FSH 2509.22, Region 10 Soil and Water Conservation Handbook (USDA Forest Service, 1991c). The handbook describes the application, monitoring, evaluation, and refinement of these BMPs. Appendix C of the Forest Plan (TLMP FEIS, 1997) provides a list and brief summary of the BMPs used in Region 10. Many other Forest Plan Standards and Guidelines apply in addition to those cited below. These standards and guidelines, including Appendix C of the Forest Plan, are incorporated by reference (TLMP, 1997 and TLMP FEIS, 1997).

Monitoring

Monitoring activities can be divided into Forest Plan monitoring, routine implementation monitoring, and project-specific monitoring. These are described below. The monitoring plan is included in Appendix E.

Forest Plan Monitoring

The NFMA requires that the National Forests monitor and evaluate their forest plans (36 CFR 219.11). The importance of this requirement is emphasized in the National Monitoring and Evaluation Strategy (USDA Forest Service, 1993). This strategy is designed to focus agency attention and resources on evaluating how forest plans are being implemented, in order to provide the Forest Service with the information needed to ensure responsive and efficient management of the National Forests. The strategy contains three principles: (1) evaluation of results will be readily available to the public, agencies, and other groups; (2) monitoring and evaluation will focus on ecosystems and will emphasize relationships among biotic and abiotic components of those ecosystems; and (3) the strategy will be flexible enough to meet local needs while encompassing forest, regional, and national requirements.

Three levels of monitoring are incorporated into Forest Plan monitoring:

Implementation monitoring is used to determine if the goals, objectives, standards and guidelines, and management prescriptions are implemented as detailed in the Forest Plan.

Effectiveness monitoring is used to determine if the standards and guidelines and the management prescriptions, as designed and implemented, are effective in meeting the Forest Plan goals and objectives.

Validation monitoring is used to determine whether the data, assumptions, and coefficients used in developing the plan are correct.

Most monitoring elements involve the mitigation measures discussed in the previous section. The three types of monitoring listed above are used to determine if the measures were implemented and if they are effective in mitigating the effects of the project or if they need to be revised. Information derived from monitoring can be used to develop improved or additional treatments to ensure that mitigation will be effective in the future.

A monitoring report is prepared by the Tongass National Forest and released each year. The report addresses all monitoring questions contained in the Forest Plan. It references all monitoring being conducted on the Tongass National Forest and assesses progress toward achieving the goals and objectives of the Forest Plan. The report either certifies that the Forest Plan is sufficient to guide management of the Tongass National Forest over the next year or it proposes the changes needed to achieve the goals and objectives and an approach for making those changes.

Forest Plan monitoring is conducted over the entire Tongass National Forest on a sample basis. Samples will be taken within the Skipping Cow Project Area. These results can be used to help answer questions regarding the implementation and effectiveness of mitigation within the Project Area. A number of implementation, effectiveness, and validation monitoring items are identified for each resource area in the Forest-wide monitoring plan described in the Forest Plan (TLMP, 1997).

Routine Implementation Monitoring

Routine implementation monitoring assesses whether the project was implemented as designed and whether it complies with the Forest Plan. Planning for routine implementation monitoring began with the preliminary design of the harvest units and the road system. Specialists used on-the-ground inventories, computer inventories, and aerial photographs to prepare a unit card for each harvest unit in each alternative (Appendix B). Cards were also prepared for each road (Appendix C). Resource specialists recorded their concerns on the cards and the mitigation measures needed to address those concerns in the design of each unit and road. Silvicultural prescriptions will be prepared for each unit in the preferred alternative. These concerns, mitigation measures, and prescriptions will be refined during the final layout phase of the project, when specialists will use

the knowledge they gain in the field to revise the unit card and road card recommendations and prescriptions as needed. Implementation monitoring will use the final unit and road card mitigation measures and prescriptions as the basis for determining if recommendations were implemented in the project.

Routine post-sale monitoring is also done by the road maintenance crew and by silviculturists. The road maintenance crew annually checks roads on the district for trees across the road, plugged culverts, and brushing needs. The silviculturist routinely monitors each harvest unit to determine if adequate regeneration of trees to meet NFMA requirements has been accomplished.

Project-Specific Monitoring

Project-specific monitoring can be considered a form of effectiveness monitoring. The project-specific monitoring items, and their methods and costs, are described in Appendix E. While implementation monitoring looks at such questions as "Have the specified number of BMPs been implemented?" or "Have the required number of gates been installed?", the monitoring described in Appendix E seeks to determine if those BMPs and/or gates are effective in achieving road management objectives for those roads and resource objectives for that area.

Project-specific monitoring often overlaps with Forest Plan monitoring. In fact, project-specific monitoring is designed to answer the questions posed in Table 6-1 of TLMP (1997), so that, whenever possible, monitoring requirements in the Forest Plan can be met by compiling the monitoring results of individual projects.

Comparison of Alternatives

This section compares the alternatives based on how they respond to the major issues discussed in Chapter 1. The information presented here is derived from the analyses presented in Chapter 3. The affected environment and the environmental effects are discussed in greater detail in Chapter 3. A comparison of Alternatives 1 through 5 is provided on Table 2-5.

Issue 1, Project Economics

Alternative 3 provides the highest timber volume, approximately 24.5 MMBF, and the highest net stumpage ($158/thousand board feet [MBF], at the high market analysis, $2/MBF, at the low market analysis). Alternative 2 provides the second highest volume, approximately 22.1 MMBF, but it has a lower economic return ($95/MBF, high market, and a negative $61/MBF low market). Alternative 4 provides approximately 21.6 MMBF, and it has the second lowest net stumpage ($106/MBF, high market, and a negative $50/MBF, low market). Alternative 5

provides the lowest volume, about 19.1 MMBF, but it has the second highest net stumpage ($134/MBF, high market, and a negative $22/MBF, low market). Alternative 1, No Action, would not produce any timber volume.

Issue 2, Road Access Management

Alternative 1 (No Action) would have the least adverse impacts to wildlife, including deer, but it would not improve access for timber management in the Project Area. It would not alter access for subsistence hunting.

Of the action alternatives, Alternative 3 would provide the best access for timber management, followed by Alternatives 5 and 2. Alternative 4 would provide the poorest access, requiring large areas suitable for cable yarding to be harvested using a helicopter. However, Alternative 4 would have the least impact on wildlife, followed by Alternatives 5 and 2. Alternative 3 would have the greatest impact.

Under Option A, all new system roads would remain open for public use. Under all action alternatives, Option B—closing specific roads to public access—would be preferable because it would minimize adverse impacts to wildlife. Access for subsistence hunting would improve somewhat, since hunters could hike the closed roads and some roads and may access some areas using ATVs. The three subsistence hunters that testified at the ANILCA 810 hearing wanted the roads left open (Option A).

Issue 3, Wildlife Habitat

Alternative 1, No Action, would have the least effect on wildlife habitat.

Of the action alternatives, Alternative 4 would have the least adverse impact on old growth habitat and interior habitat (Table 2-5). It would also have the least impact on ESA-listed species, sensitive species, Management Indicator Species (such as wolves), and other species of interest (goshawk, murrelets, etc.) because it would not build roads into the Nesbitt and upper Middle Meter Bight drainages and because it would implement uneven-aged management in the Nesbitt area.

Alternative 3 would have the greatest impact on these resources and species because it would have the greatest increase in new road construction and relies on even-aged management. Alternatives 5 and 2 are intermediate. Alternative 5 would not extend Road 52033 as far along Nesbitt Ridge and would not harvest important deer habitat in the Nesbitt area at this time. Alternative 2 would build the same road as Alternative 3 in the Nesbitt area but would not include a new road into the upper Middle Meter Bight area. Road densities in the Project Area would range from 0.32 mile per square mile for Alternative 4 to 0.51 mile per square mile for Alternative 3 under Option A. Road density would be 0.17 mile per square mile under Option B for all action alternatives (Table 3-13 in Chapter 3). Also, Alternative 2 does not include any clearcutting. It implements

two-aged management, leaving 20 to 30 percent of the trees over 9 inches DBH to provide wildlife habitat.

Alternative 4 would have the least effect of the action alternatives on the wildlife corridor linking the Medium Old Growth Reserves on either side of the Project Area. The effect of Alternative 4 would be only slightly greater than under the No Action Alternative. Unlike the other action alternatives, Alternative 4 would not build Road 52033, which would bisect the corridor near Nesbitt Ridge. Also, because only 25 percent of the trees over 9 inches DBH would be removed, there would be little increased risk of windthrow within the corridor north of Unit 9 (Figure 3-2 in Chapter 3). Alternatives 2 and 3 would build Road 52033, bisecting both the northwest and southwest forks of the corridor (Figures 3-2 and 3-3 in Chapter 3). Both alternatives would also result in an increased risk of windthrow to the southwest fork of the corridor (north of Unit 9). Alternative 2 would leave 20 to 30 percent of the trees over 9 inches DBH, which may help reduce blowdown in that portion of the corridor adjacent to Unit 9. Alternative 5 would only extend Road 52033 as far as Unit 8 (Figure 3-5 in Chapter 3). It would only bisect the northwest fork of the corridor. Therefore, it would have less effect than Alternatives 2 and 3. Because of its width, the northwest fork of the corridor is not expected to be at an increased risk of windthrow under any of the alternatives. The remainder of the corridor (i.e., the portion east of Nesbitt Creek) is not close to any proposed unit or road. However, even under the No Action Alternative, the corridor is less than ideal. It is narrow in many places due to natural features, such as topographic breaks and wetlands. These features also result in short breaks in the old growth forest. Also, the corridor is bisected by an existing road (Road 6594).

Issue 4, Subsistence

None of the alternatives would have a major effect on subsistence. Alternative 4, and to a somewhat lesser extent, Alternative 5 would protect more deer winter range than Alternatives 2 and 3. This is expected to have a minor effect on the deer population and on subsistence hunting overall. The deer population is currently higher than the long-term carrying capacity than the Island can sustain if a series of harsh winters occurs.

Subsistence hunters that gave testimony at the ANILCA 810 hearings held in Wrangell (August 9, 1999) supported keeping roads open to allow access to newly harvested areas for hunting and berry picking.

Issue 5, Wind Ecology

Alternative 1 would not result in an increased risk of windthrow over natural conditions at this time. Future timber sales would be likely to have similar effects as those described below. Alternative 5 is designed to respond to recent information on large-scale wind disturbance in the Nesbitt Ridge area. It would build less road into the wind-prone area west of Nesbitt Creek than Alternatives 2 and 3. One large unit (Unit 8), located at the top of the area that has received catastrophic wind damage in the past, would be clearcut under Alternative 5. Future units along Nesbitt Ridge would harvest into the wind. Therefore, the remaining forest would only have harvest-created "edge" in stream buffers and on the side protected from the prevailing wind. This alternative may have the greatest likelihood of preventing large-scale, harvest-caused windthrow.

Alternative 4 would not build Road 52033 and Road 52034, reducing road-related windthrow. It would only remove 25 percent of the trees over 9 inches DBH in the wind-prone area west of Nesbitt Creek. This may have the effect of reducing windthrow, especially in stream buffers and along the edges of the harvest units compared to the other action alternatives. However, the remaining trees within the units would be subject to wind damage. Alternatives 2 and 3 would be more likely to induce harvest-related windthrow in stream buffers and along the unit edges. While within-unit leave trees under Alternative 2 might lessen the edge effect, they would also be subject to windthrow.

Environmentally Preferred Alternative

Alternative 1, No Action, is the environmentally preferred alternative because it would have the least impact on the natural environment. However, it would not meet the purpose and need (pages 4 and 5), which includes managing the majority of the Project Area for timber production.

Table 2-5
Comparison of Alternatives

Issue	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Timber Economics					
Acres harvested (including right-of-way)	0	1,139	1,119	1,756	911
Percent of suitable acres harvested	0	16	16	25	13
Cable volume harvested (MMBF)[1/]	0	18.8	24.4	7.6	19.1
Helicopter volume harvest (MMBF)[1/]	0	3.3	0	14.0	0
Total volume harvested (MMBF) (including right-of-way)[1/]	0	22.2	24.5	21.6	19.2
Percent of total volume harvested	0	14	16	14	12
Net stumpage, low market ($/MBF)	0	-61.51	2.00	-49.50	-21.52
Net stumpage, high market ($/MBF)	0	94.76	158.00	106.50	134.48
System road construction (miles)	0	9.6	11.8	4.2	10.7
Temporary road construction (miles)	0	3.5	4.4	1.4	3.9
Direct jobs created[2/]	0	117	129	114	101
Estimated payment to the State, high market value (U.S. $)	0	969,772	1,485,026	789,904	1,122,909
Access Management					
Roads open to motorized vehicles in the Project Area under Option A[3/]	7.8	18.4	20.6	13.0	19.5
Roads open to motorized vehicles in the Project Area under Option B[4/]	7.8	7.8	7.8	7.8	7.8
Percent increase in Project Area roads under Option A	0	136	164	67	150
Roads open to motorized vehicles on Zarembo Island under Option A[3/]	107	126	128	120	127
Roads open to motorized vehicles on Zarembo Island under Option B[4/]	107	107	107	107	107
Wildlife Habitat					
High value deer habitat harvested out of 1,403 acres in Project Area (acres)	0	29	28	53	28
Percent of high value deer habitat	0	2	2	4	2
High value black bear habitat affected out of 3,700 acres in Project Area (acres)	0	1,625	1,625	1,296	1,543
Percent of high value bear habitat affected	0	44	44	35	42
High volume old-growth harvested out of 1,308 acres in Project Area (acres)	0	175	174	253[5/]	122
Medium volume old-growth harvested out of 4,514 acres in Project Area (acres)	0	847	848	1,073[5/]	708
Low volume old-growth harvested out of 3,514 in Project Area (acres)	0	72	72	422[5/]	39
Subsistence					
Deer habitat capability per square mile	24	23	23	24	23
Wind Ecology					
Wind-prone areas harvested (acres)	0	719	719	1,320[6/]	520
Watershed Effects					
Percent of Project Area harvested within 30 years	5	9	9	11[5/]	8[5/]
Number of fish-bearing stream crossings under Option A[7/]	43	43	43	43	43
Number of fish-bearing stream crossings under Option B[7/]	43	43	43	43	43
Number of bridges	0	2	4	1	4
Number of culverts 48 inches or larger	0	15	14	5	16
Road density in the Project Area (mi/mi^2) – Option A	0.19	0.46	0.51	0.32	0.48
Road density in the Project Area (mi/mi^2) – Option B	0.19	0.17	0.17	0.17	0.17
Acres of MMI 3 soils in harvest units[8/]	0	109	90	173	59
Acres of MMI 4 soils in harvest units[9/]	0	0	0	0	0

1/ Includes sawlog and utility.
2/ Based on 5.28 jobs per MMBF.
3/ Approximately 1 mile of existing but impassable road (Road 6594 beyond Snail Creek) would be reopened under Alternatives 2 to 5, Option A. Total includes 1 mile of reconstruction. Includes 4.7 miles of road passable only to ATVs.
4/ ATVs may access some closed roads.
5/ Includes areas in which 25 percent of the trees over 9 inches DBH would be removed, dropping the area one volume stratum (e.g., high volume becomes medium volume).
6/ Only 25 percent of the trees over 9 inches DBH would be removed on 957 acres of the 1,268 acres cut in wind-prone areas.
7/ There are 43 fish stream crossings on existing roads (No Action Alternative). These stream crossings are in the action alternatives as well.
8/ MMI = Mass Movement Index
9/ Suspected MMI 4 soils in harvest units were field verified between DEIS and FEIS. No MMI 4 soils were found.
MBF = thousand board feet
MMBF = million board feet

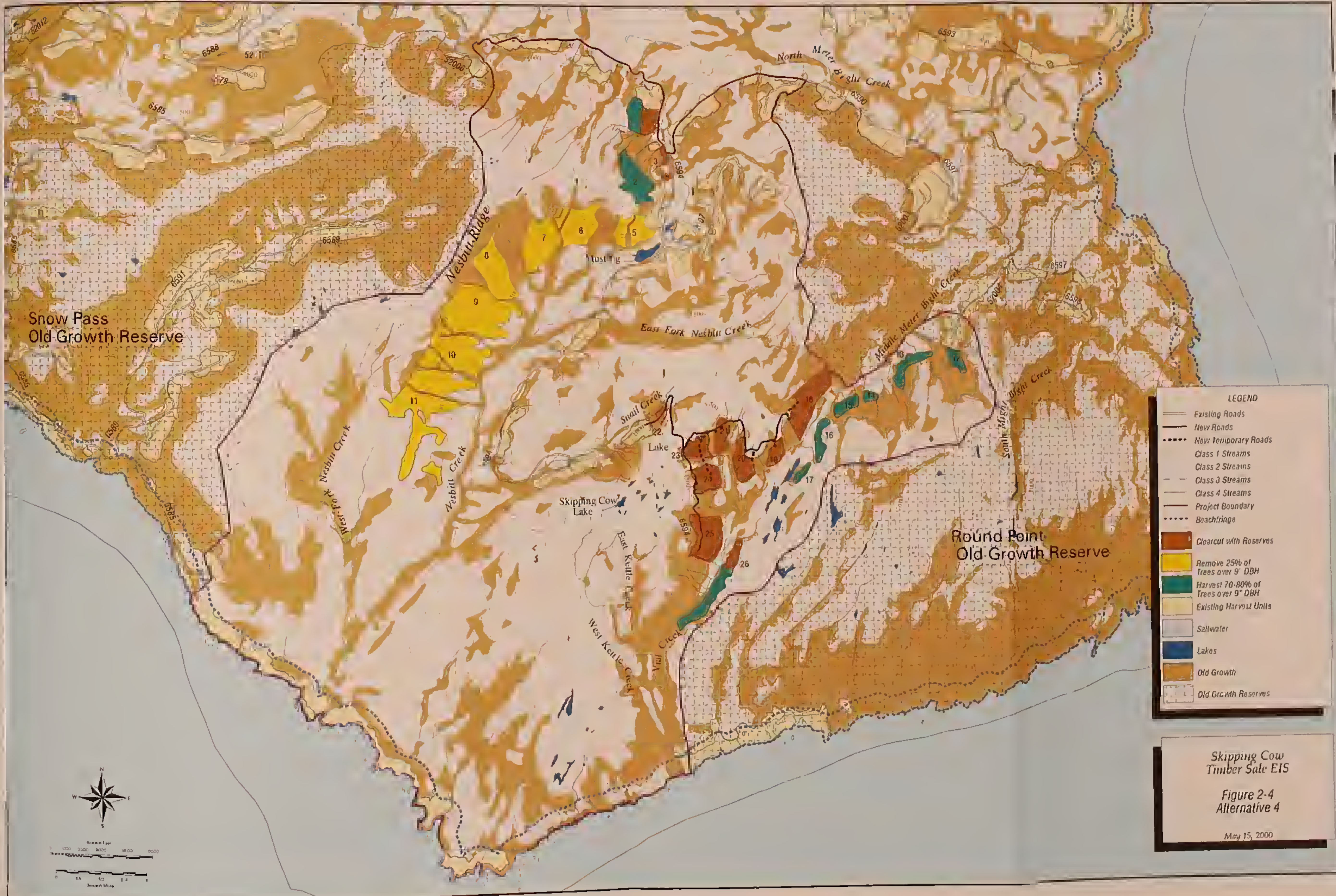
Skipping Cow
Timber Sale EIS
Figure 2-1
Alternative 1

March 13, 2000

/whistler1/skippingcow/amls/ps-fig11x17.aml - March 13, 2000 projectarea.ps

/wstler/skippingcow/amls/hpg-alts11x17.aml - May 15, 2000 alt2.ps

/whistler1/skippingcow/amls/hpg-alts11x17.aml - May 15, 2000 alt3.ps



Skipping Cow Timber Sale EIS

Figure 2-4
Alternative 4

May 15, 2000

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Chapter 3

Affected Environment and Environmental Effects

Chapter 3 Affected Environment and Environmental Effects

Introduction

In this chapter, we describe the environment that would potentially be modified by this project (affected environment), and the effects of the five alternatives on the environment (environmental effects). This chapter is divided into two main sections:

Effects on the Key Issues—In this section, we describe the effects of each alternative on the five key issues.

Other Environmental Considerations—In this section we summarize other environmental considerations, which are not characterized as key issues for this project, but are valuable to discuss.

Effects on the Key Issues

The Council on Environmental Quality (CEQ) issues guidance to Federal agencies to determine the significant issues concerning any proposal, and to eliminate those issues that are not significant. With the help of the public and other agencies, we identified the five issues that were significant enough to be examined in detail, given the nature of the proposed action. In this section, we describe the environmental effects associated with these five issues.

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Issue 1: Project Economics

Introduction

This project has the potential to affect employment and the economy of local communities. This was brought up as an issue during public scoping. Public comments indicated concern about current changes in the timber industry. Comments ranged from voicing strong support for harvesting timber in the Project Area to questioning the need for the sale given the recent mill closures. The amount of wood harvested and any infrastructure developed with this entry may affect availability and costs associated with future entries for timber harvest. Roads constructed for timber harvest may make future sales more economical, but the access they provide could affect wildlife, subsistence hunting, and water quality.

The Forest Plan (TLMP FEIS, 1997) includes a comprehensive analysis of the economic and social environment for Southeast Alaska, the Tongass National Forest, and the communities within these areas. The scope of the economic and social analysis has to be broader than just the Skipping Cow Project Area; thus, the Forest Plan analysis and documentation found in its Final EIS are most applicable. Included in the Final EIS (Volume 2) pages 3-431 to 3-685 and Appendix H are discussions of various aspects of the economy, timber industry, fishing industry, recreation and tourism industry, demographics, and information pertinent to each community in the region. This information is incorporated by reference.

Employment in Southeast Alaska

Approximately 80 percent of Southeast Alaska is within the Tongass National Forest, which stretches roughly 500 miles from Ketchikan in the southeast to Yakutat in the northwest. With little private land available, the region is sparsely settled. Approximately 74,000 people live in 33 towns and villages located in and around the Forest. The communities of Southeast Alaska depend on the Tongass National Forest to provide the foundation for natural resource-based industries which include wood products, commercial fishing and fish processing, recreation, tourism, mining, and mineral development. Many residents also depend heavily on subsistence hunting and fishing to meet their basic needs. There is very little private land in the region to provide these resources. Appropriate management of the Tongass' natural resources is, therefore, extremely important for local communities and the overall regional economy. An overview of regional employment is provided in the Economics Resource Report (USDA Forest Service, 1998a).

3 Issue 1: Project Economics

Employment in the Project Area

The Skipping Cow Timber Sale is located on the southern part of Zarembo Island. The nearby communities of Wrangell and Petersburg both have significant documented use of Zarembo Island. Other communities located within the general vicinity include Coffman Cove and Whale Pass. However, logging activities in these communities are more oriented south toward Prince of Wales Island. Employment patterns are discussed in Appendix H of the Forest Plan (TLMP FEIS, 1997) and are incorporated by reference. Detailed employment information is provided for Wrangell and Petersburg in the Subsistence Resource Report (USDA Forest Service, 1998a) and summarized in the Subsistence section. In general, the economies of Wrangell and Petersburg are dominated by commercial fishing, logging, timber processing, and government activities. Despite recent growth, tourism and commercial recreation activities still account for a relatively small portion of local economic activity.

Forest Products Employment

The forest products industry has been an important part of the economy of Southeast Alaska since the 1950s. Recent forest products employment data are presented in Table 3-1. From 1987 through 1996, the forest products industry provided direct employment for an average of 2,791 workers. Indirect employment, which includes related service activities, such as transportation, marketing, and equipment sales and maintenance, provided an additional 2,014 jobs. Direct and indirect employment during this period peaked in 1990 with totals of 3,543 and 2,570 jobs, respectively.

Employment has dropped recently, primarily due to lower market conditions. Also, since 1996, the pulp mill in Ketchikan has closed, lowering employment in that category by approximately 500 jobs.

Table 3-1
Forest Products Industry Employment 1987 to 1996

Employment Type	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Logging	1,545	1,981	2,113	2,144	1,554	1,415	1,344	1,177	1,185	1,157
Saw Mill	375	468	478	500	604	538	447	515	301	230
Pulp Mill	861	892	925	899	911	910	859	533	516	524
Total Direct	2,781	3,341	3,516	3,543	3,069	2,863	2,650	2,225	2,002	1,911
Indirect	1,950	2,350	2,550	2,570	2,226	2,077	1,935	1,624	1,461	1,395
TOTAL	**4,731**	**5,691**	**6,066**	**6,113**	**5,295**	**4,940**	**4,585**	**3,849**	**3,463**	**3,306**

Source: TLMP FEIS, 1997; USDA Forest Service, 1998n
MMBF = million board feet

Timber Supply

In order to maintain a stable timber sales program and provide a continued flow of timber to regional timber processors, the Forest Service employs a "buffer stock" approach to timber sale planning. This is designed to provide regional timber operators with the opportunity to acquire uncut timber supplies equal to approximately three years consumption. This buffer stock approach is intended to allow firms dependent on National Forest timber to respond to increases in market demand. In the event of a sudden increase in demand, producers will have sufficient uncut timber under contract to increase production without waiting for the Forest Service to take action. The volume under contract is typically drawn down during periods of high market demand and built up during periods of relatively low demand.

The timber sales program is complex and requires that the Forest Service manage four "pools" of timber volume:

- Timber volume in preparation—This pool contains sales that are being analyzed and undergoing public comment through the NEPA process. This can take from 1 to 4 years to complete and ends when a NEPA decision is made.

- Timber volume in appeals and litigation—This pool contains sales on which action is stayed or deferred as a result of the administrative appeals process or litigation. This process can take as little as 60 days, if no appeals are filed, or 1 to 4 years if litigated.

- Timber volume available for sale—This pool contains sales for which environmental analysis has been completed, administrative appeals have been resolved, and litigation, if any, has been resolved. This volume is available to program managers to schedule for sale offerings. Managers need to maintain enough volume in this pool to be able to schedule future sale offerings in an orderly manner and of the size and configuration that best meets the needs of the public. The Forest Service tries to announce probable future sale offerings at least a year in advance to allow potential purchasers an opportunity to conduct their own evaluations of these offerings in order to determine whether to bid and, if so, how much to offer.

- Timber volume under contract—This pool contains sales that have been sold but not yet harvested. Timber contracts typically give the purchaser 3 years to harvest or remove the timber purchased. Long-standing Forest Service practice is to maintain about 2 or 3 years of unharvested timber volume under contract to purchasers. This practice is not limited to the Alaska Region, but is particularly relevant to Alaska because of the nature of the land base. The relative absence of roads, the island geography and steep terrain means that much of the timber is isolated and timber purchasers need longer-than-average lead times to plan operations, stage equipment, set-up camps, and construct roads prior to beginning harvest.

Timber sales can take from 3 to 7 years to complete. Sales offered by the Forest Service vary in size to meet the needs of different purchasers. The time taken to complete a sale may vary with the size of the offering. Further uncertainty and delays may be introduced through appeals and litigation.

The buffer stock approach and the variable length of the timber sale process make it difficult to draw a direct relationship between particular sales and regional timber demand. The proposed Skipping Cow Timber Sale is a necessary component of the Forest Service's timber sales program, which requires a continuous pipeline of projects progressing through the four timber pools identified above. Market demand is discussed in the following section.

Market Demand for Timber

Market demand for timber varies dramatically from year to year. A variety of factors influence the demand for Southeast Alaskan timber. These factors include interest rates, housing markets, exchange rate fluctuations, national and international competition, regional and world markets, and timber availability and cost. Future demand is particularly difficult to forecast at the present because the forest products industry in Southeast Alaska is undergoing a significant transition from long-term sales to a strictly independent market.

The nature of the land base in Southeast Alaska results in high cost timber sale offerings that may carry significant economic risk for potential purchasers. This is the case with the proposed Skipping Cow Timber Sale. High costs would be incurred as a result of the Project Area's island location and road construction needs. Significant costs would also be incurred on alternatives that require helicopter logging. As a result of recent legislation that has eliminated purchaser credit effective April 1, 1999, road construction costs are considered a purchaser cost rather than a long-term economic asset. Market stumpage values must be sufficient to cover these costs and offer a profit for potential purchasers.

The cyclical nature of timber markets makes it difficult to predict future demand and selling prices, but Forest Plan market assessments indicate sufficient regional mill capacity and market demand for sawlogs (TLMP FEIS, 1997). Bidding on Stikine area timber sales has shown strong competitive demand for stumpage that, in some cases, far exceeds advertised rates. There have also been periods where demand was low. Fluctuations in demand likely reflect changing market conditions but may also be influenced by the characteristics of individual sales. The final Skipping Cow Timber Sale appraisal will include current quarter selling values, cost information, and normal profit and risk margin.

Effects

Projected Employment and Income

The proposed Skipping Cow Timber Sale would play an important role in the overall Tongass National Forest sales program, helping to meet market demands for timber and retain existing employment levels. The proposed alternatives would generate between 101 and 129 direct jobs and 175 and 223 total jobs (Table 3-2). These estimates assume a ratio of 5.28 direct jobs (1.95 logging and 3.33 sawmill) per MMBF. Total jobs were calculated by multiplying direct jobs by a multiplier of 1.73 (TLMP FEIS, 1997). Direct income estimates were developed for each alternative based on an average wood products earnings estimate of $47,437 per employee. This figure, derived from the Forest Plan (TLMP FEIS, 1997) was adjusted to 1998 dollars. Total income was estimated using a multiplier of 1.73. The proposed alternatives would generate between $4.78 million and $6.11 million in direct income and $8.26 and $10.57 million in total income. A comparison of total jobs was made rather than an estimate of jobs per year because of the variability and uncertainty of the sale life.

Table 3-2
Total Projected Employment and Income by Alternative

Alternative	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Projected Harvest Volume (MBF)	0	22,231	24,465	21,619	19,186
Direct Jobs[1/]	0	117	129	114	101
Total Jobs	0	203	223	197	175
Direct Income (Million $)[2/]	0	5.62	6.18	5.46	4.85
Total Income (Million $)	0	9.72	10.70	9.45	8.39

1/ Job/harvest ratios are from TLMP, 1997

2/ Wood products income estimates are from TLMP FEIS, 1997 adjusted to 1998 dollars.

Economic Efficiency Analysis

Determining the economic efficiency of each timber sale offering is an important step in the Forest Service planning process. Forest Service policy and handbook direction (FSH 2409.18 Amend. 90-1 and Supp. 6) requires an economic efficiency assessment to compare the benefits and costs of each proposed timber sale project and determine if the sale would be a positive economic offering. This economic efficiency analysis compares expected gross revenues with estimated costs to arrive at an estimate of future net revenues.

Pond log values represent the delivered price of logs at the mill minus the cost to manufacture them into usable products. As a result of significant recent fluctuations in market prices, the proposed alternatives are analyzed using both "low" and "high" market values. The low market pond value used in this

analysis is calculated from an average of data from 1998 sales in the Stikine area and weighted by the volume of each sale. The high market pond value is based on first quarter 1995 values and average Forest-wide species composition.

Logging, or stump to truck costs, vary by volume class (indices of the average quantity of timber per acre) mainly due to the size of logs yarded. In general, the higher the volume per acre, the larger the logs, and the lower the logging costs per MBF. Logging and transportation cost calculations used in this analysis are based on the Forest Service Timber Appraisal Handbook for Region 10. The stump-to-truck costs were determined using zone averages and include felling, bucking, sorting, loading, yarding, and general logging overhead. Truck haul costs are based on the average time per trip assuming that all loads are hauled to the Deep Bay LTF. Log tow was calculated assuming that the Wrangell mill is the final destination. Average logging and transportation costs were increased by a factor of 1.0228, which is the Log Cost Update Factor specified in Forest Service Interim Directive 2409.22-98-4.

Existing roads will need some ditching, grading, and brushing. These costs are estimated using an average cost per mile plus an additional cost for unusual items such as bridges or large culverts. New road construction costs are calculated using average construction cost per mile plus additional costs for unusual items. Post-harvest road treatments are also calculated using an average cost per mile.

Stumpage value was calculated for each alternative by subtracting estimated logging, transportation, and road construction costs from the pond log value. An allowance of 60 percent of normal profit and risk was also included as a cost and subtracted from pond log values per Forest Service Handbook 2409.18. The stumpage value does not include bid premiums that could result from competitive bidding for the timber when sold. It should also be noted that chip (or other value added product) values have not been added into the pond log values. In an actual appraisal, an appropriate chip value would be added to the value per MBF.

The low value market analysis produced net stumpage values ranging from $-61.24 to $2 (Table 3-3). All the stumpage values were positive using the high market value and ranged from $94.76 to $158 per MBF. A positive net stumpage value generally indicates an economically viable alternative. The variation in net stumpage between alternatives is primarily due to differing amounts of road construction, use of cable or helicopter yarding systems, and clearcut or partial cut silvicultural prescriptions.

Alternatives 3 and 5 would provide the highest net stumpage values ($158 and $134.47 per MBF based on the high market value, respectively). These alternatives would have more road construction than Alternatives 2 and 4. Alternatives 3 and 5 would use cable yarding systems for the entire harvest. Alternatives 2 and 4, with less proposed road construction, would employ a

Table 3-3
Economic Efficiency Analysis

	Alternatives				
	1	2	3	4	5
Harvest Volume (MBF) 1/	0	22,231	24,465	21,619	19,186
Revenues ($/MBF)					
Low Market Pond Value 2/	0	365	365	365	365
High Market Pond Value 3/	0	521	521	521	521
Costs ($/MBF)					
Stump to Truck 4/	0	245.26	176.28	277.13	184.31
Transportation 5/	0	51.75	52.41	48.21	53.08
Road Work	0	80.23	85.30	40.15	100.14
Logging Profit and Risk (60% of normal) 6/	0	49.00	49.00	49.00	49.00
Total Costs ($/MBF)	0	426.24	363.00	414.50	386.53
Net Stumpage ($/MBF)					
Low Market	0	-61.24	2.00	-49.50	-21.52
High Market	0	94.76	158.00	106.50	134.47

1/ Includes road right-of-way volume outside of units.
2/ The low market pond value used in this analysis is calculated from an average of data from 1998 sales in the Stikine area and weighted by the volume in each sale.
3/ The high market pond value used in this analysis is based on First Quarter 1995 values and average Forest-wide species composition.
4/ Includes felling, yarding, sorting and loading, general logging overhead, and temporary construction.
5/ Includes truck haul (and delay), dump and raft, and tow to Wrangell.
6/ Logging profit and risk is an average of the values presented in the Canal Hoya Timber Sale EIS (USDA Forest Service, 1998n).

combination of cable and helicopter yarding. Roads allow the use of relatively cost-effective cable yarding systems instead of helicopter yarding. It is much more economical to cable log than helicopter log in the Project Area. Both Alternatives 3 and 5 would also be relatively low cost because clearcuts are prescribed for all units. Clearcutting is less expensive than partial cutting for all yarding systems except helicopter.

Alternative 4 would provide the third highest net stumpage value after Alternative 5. Approximately 65 percent of the volume of this alternative would require helicopter yarding and the silvicultural prescription requires partial cutting. Logging is more difficult and costly when partial cutting is used rather than clearcutting because of the need to maneuver harvested logs around trees that remain. Alternative 4 would have the lowest construction and haul costs, but the highest yarding (stump-to-truck) costs.

The net stumpage value is lowest for Alternative 2. Approximately 15 percent of the volume of this alternative would require helicopter yarding, which would result in relatively high stump-to-truck costs. High road costs would be incurred relative to Alternative 4 because the remaining 85 percent of the volume of this alternative would require cable yarding. Costs are further increased as a result of partial cut silvicultural prescriptions.

In summary, Alternatives 3 and 5 would provide the highest net stumpage values because of the clearcut prescriptions and the use of cable yarding. Alternative 4 would provide the second lowest net stumpage value due to the helicopter yarding requirements and increased cable yarding costs associated with the partial-cut prescription. Alternative 2 would be the most costly alternative because it would involve helicopter yarding, road construction, and partial-cut harvesting. Alternative 1 is the No Action Alternative and, therefore, does not have an associated net stumpage value.

Payments to the State

As part of the Federal 25 Percent Fund Act of 1908 and subsequent amendments to the Act in 1976, 25 percent of gross National Forest receipts from net stumpage and purchaser credit for specified road construction are returned to the State where the forest is located. Recent legislation, (Public Law 105-277) has eliminated purchaser credit effective April 1, 1999. As a result, road construction costs are considered a purchaser cost of national forest timber. Payments to the State are now based on net stumpage value plus the estimated cost of road construction. These payments to the state are used for the benefit of public schools and roads. The State of Alaska distributes the funds to organized boroughs and municipalities. The estimated high value payments to the State of Alaska are presented for each alternative in Table 3-4. Estimated high value payments to the cities of Wrangell and Petersburg are also identified. These figures are based on the average proportion of Tongass National Forest minimum payments that were distributed to Wrangell and Petersburg for the Federal fiscal years 1994 to 1997. Local communities would not benefit from Federal 25 Percent Fund Act receipts under the No Action Alternative.

Table 3-4
Estimated Payments to the State

	Alternative				
	1	2	3	4	5
Total Harvest Volume (MBF)	0	22,231	24,465	21,619	19,186
Net Stumpage Value per MBF (High Market) [1/]	0	94.76	158.00	106.50	134.47
- Less Contribution to U.S. Treasury [2/]	0	94.26	157.50	106.00	133.97
- Multiplied by Harvest Volume	0	2,095,494	3,853,238	2,291,614	2,570,348
Minimum Base Rate Value per MBF [3/]	0	5.87	5.87	5.87	5.87
- Less Contribution to U.S. Treasury [2/]	0	5.37	5.37	5.37	5.37
- Multiplied by Harvest Volume	0	119,380	131,377	116,094	103,029
Specified Road Cost	0	1,783,593	2,086,865	868,003	1,921,286
State Receipt (High Market) [4/]	0	969,772	1,485,026	789,904	1,122,909
State Receipt (Minimum Base Rate) [4/]	0	475,743	554,561	246,024	506,079
Wrangell Payment (High Market) [5/]	0	68,466	104,843	55,767	79,277
Wrangell Payment (Minimum Base Rate) [5/]	0	33,587	39,152	17,369	35,729
Petersburg Payment (High Market) [5/]	0	95,813	146,721	78,043	110,943
Petersburg Payment (Minimum Base Rate) [5/]	0	47,003	54,791	24,307	50,001

1/ The high market pond value used in this analysis is based on First Quarter 1995 values and average Forest-wide species composition.
2/ $0.50/MBF is the minimum payment to the U.S. Treasury.
3/ The minimum base rate value is the minimum sale price permitted by law. Values are established by species. The minimum base rate figure presented here, based on the species composition of Alternative 5, is applicable to all of the proposed alternatives.
4/ 25 Percent Fund Act payments to the State are based on 25 percent of net stumpage value plus the estimated cost of specified road construction less payments to the U.S. Treasury.
5/ 7.06 and 9.88 percent are the average portion of Tongass National Forest minimum payments, respectively, that were distributed to Wrangell and Petersburg for the Federal fiscal years 1994 to 1997.
Source: Logging Systems Resource Report; USDA Forest Service, 1998m

Public Investment Analysis

The following public investment analysis of the proposed Skipping Cow Timber Sale alternatives uses the high market net stumpage values calculated for the project. The average Region 10 Budget Allocation costs and management expenses, which include NEPA planning, sale preparation and administration, and engineering support, are subtracted from net stumpage revenues to determine net value. This information is presented for each alternative in Table 3-5.

Based on high market net stumpage values, net revenues under Option A range from negative $340,174 for Alternative 2 to $1,140,987 for Alternative 3. Under Option B, net revenues range from a negative $418,458 for Alternative 2 to $1,041,280 for Alternative 3. The net revenues from the proposed alternatives are expected to be less than those from future harvests in the area because infrastructure improvements associated with this project would support future

timber harvests. This analysis is based on the assumption that estimated revenues for an alternative will actually occur. It does not reflect fluctuations in market conditions, competitive bidding, or changes in pond log value resulting from changes in product values. The values provided here are useful primarily for comparison purposes.

Table 3-5
Public Investment Summary

	Alternative				
	1	2	3	4	5
Volume (MBF)	0	22,231	24,465	21,619	19,186
Net Stumpage Value per MBF (High Market) 1/	0	94.76	158.00	106.50	134.47
Total Stumpage Value (High Market))	0	2,106,709	3,865,577	2,302,481	2,579,941
Minimum Base Rate Value per MBF 2/	0	5.87	5.87	5.87	5.87
Total Stumpage Value (Minimum Base Rate)	0	130,496	143,610	126,904	112,622
R10 Budget Allocation Costs ($/MBF) 3/	0	101	101	101	101
Road Management Costs (Option A)	0	202,550	249,065	88,589	225,807
Road Management Costs (Option B)	0	280,834	348,772	111,498	314,803
Total Costs (Option A)	0	2,447,881	2,720,030	2,272,108	2,163,593
Total Costs (Option B)	0	2,526,165	2,819,737	2,295,017	2,252,589
Net Value (High Market) (Option A)	0	-340,172	1,145,840	30,373	416,348
Net Value (High Market) (Option B)	0	-419,456	1,045,840	7,464	327,352
Net Value (Minimum Base Rate) (Option A)	0	-2,317,385	-2,576,420	-2,145,204	-2,050,971
Net Value (Minimum Base Rate) (Option B)	0	-2,395,669	-2,676,127	-2,168,113	-2,139,967

1/ The high market pond value used in this analysis is based on First Quarter 1995 values and average Forest-wide species composition.

2/ The minimum base rate value is the minimum sale price permitted by law. Values are established by species. The minimum base rate figure presented here, based on the species composition of Alternative 5, is applicable to all of the proposed alternatives.

3/ Forest Service costs/MBF are estimated at $101/MBF. This estimate is based on the Region 10 average budget allocation of $41/MBF for NEPA, $23/MBF for Sale Preparation, $9/MBF for Sale Administration, and $28/MBF for Engineering Support.

Issue 2: Road Access Management

The Zarembo Island road system has no direct access from any communities. Road access is via boat or barge, primarily from Wrangell and Petersburg. Road use is greatest during deer hunting season. Less than 100 vehicles per day use the road system during this period.

There is concern that Zarembo Island already has an extensive road system, that these roads are expensive to maintain, and that these roads deliver sediment to the streams for years after logging is completed. Roads increase hunting pressure on wildlife. Some commenters considered this a positive effect while others considered it a negative effect, depending on whether they preferred the improved access that roads provide or hunting in unroaded areas.

Road Management Options:
- *Road* Storage
- *Decommissioned or Closed (ADNR definition)*
- *Maintenance*
- *Stormproofing*

Road Storage:
Process of putting a road into a closed condition which protects resources including soils, water quality, fisheries, and wildlife. These roads may be left in this condition for many years. The road remains on the forest road transportation inventory and will be reopened at a future date.
Three Steps of Storage:
- *1. Establishing drainages across the roadway that are self-maintaining and that effectively prevent erosion.*
- *2. Removing culverts and bridges and reestablishing the natural drainage patterns of streams.*
- *3. Returning the roadway to resource production through natural or artificial vegetation (grass, browse, or trees).*

The present road network was built and is maintained for timber management. There are approximately 115 miles of system road on Zarembo Island. Approximately 68 miles of non-system road was constructed in the past, much of which is still used for hunting access, primarily by foot travel. Approximately 107 miles of road on Zarembo Island are drivable (including 4.7 miles of roads passable only by ATVs). There are approximately 9.2 miles of system roads in the Project Area. However, approximately 1 mile of Road 6594 is currently impassable (the area beyond the Snail Creek bridge). The major public use of these roads is hunting. Approximately 0.4 mile of Road 52004 within the Project Area (in the Round Point Old Growth Reserve) has been decommissioned along with other roads in the Reserve. This was done as part of a separate project prior to the completion of the Skipping Cow Timber sale. This leaves approximately 8.8 miles of system road in the Project Area, 7.8 miles of which are drivable.

Although most of the hunting that occurs on Zarembo Island may be considered subsistence hunting, there is also a recreational component. Many residents of Wrangell and Petersburg take advantage of the road system to hunt deer. However, several people noted that some hunters hike beyond where roads end to reach the alpine areas where larger bucks tend to be found. Due to a large deer population, the presence of roads, and the proximity to Wrangell and Petersburg, Zarembo Island is very popular with deer hunters.

There are two Forest Service facilities from which vehicles can be offloaded. The St. John Harbor dock is located on the northwest side of the island and the Roosevelt Harbor bulkhead is located on the northeast side of the island. Both facilities provide access to Forest Service roads that lead to Road 6594, which enters the Project Area from the north. Based on information gathered by the subsistence specialist (for the Subsistence Resource Report [USDA Forest Service, 1998d]), it is clear that most of the hunting on Zarembo Island occurs along roads and near access points. Local guides and outfitters are not major users of Zarembo Island.

3 Issue 2: Road Access Management

Nearly 97 percent of the Project Area has a LUD of Timber Production in the Forest Plan (TLMP FEIS, 1997). Management direction includes planning a transportation system that will eventually access most of the suitable timber lands for standard logging or helicopter systems.

Effects

Decommissioning:
- *Same minimum requirements as for Storage, except that the road is removed from the forest road transportation inventory. There are no plans to reopen the roads that have been decommissioned.*

Maintenance:
- *Maintain the road to the standard assigned for the maintenance level of the road.*

Stormproofing:
- *Leave drainage structures in place, but provide waterbars, rolling dips, outslopes, and other features to ensure controlled runoff until any needed maintenance can be performed on the primary drainage system.*

The effects to road access management that would occur as a result of implementing Alternatives 2 through 5 include the expansion of the Zarembo Island road system into unroaded areas, which would provide access to suitable timber lands. Depending on post-sale management of the roads, new road construction could mean an increase in access to the area for hunters and changes in the type of hunting available in the Project Area. Hunting and other road-related disturbance could have an adverse impact on species sensitive to human disturbance. Even closed roads would increase walking use of the area, which could increase hunting pressure. The following sections discuss how each alternative would affect these access components.

Alternative 1 (No Action)

Under Alternative 1, current access patterns would continue as they are into the near future. Because the Forest Plan has assigned most of the Project Area (97 percent) to Timber Production, it can be assumed that harvest activities will occur in the Project Area at some time in the future. When harvest does occur, the effects on access may be similar to the effects discussed in Alternatives 2 through 5. Until the time when harvest would occur, actual use of the Project Area would be expected to be similar to the current use. Murrelet nesting habitat (in the upper Middle Meter Bight, upper Nesbitt, upper Mustang, and middle and upper Vial drainages), goshawk nesting habitat (in the upper Middle Meter Bight, upper Nesbitt, West Fork Nesbitt and middle and upper Vial drainages), and areas of high elk use (upper Middle Meter Bight and middle Vial drainages) would remain undisturbed by roads. Road density would remain below the threshold of concern for wolves. Approximately 7.8 miles of system road would remain open to motor vehicles in the Project Area and occasionally the roads would experience maintenance problems. In particular, the log stringer bridge on Road 6594 near the intersection with Road 52007 may need to be removed for safety reasons due to partial stringer failure. If this occurs, the road beyond the bridge would be placed in storage (culverts would be removed and normal drainage patterns would be restored).

Alternative 2

Alternative 2 would construct approximately 9.6 miles of new system roads, replace a bridge, and reconstruct 1 mile of existing road (Table 3-6). The new

roads would represent an increase of approximately 10 percent in roads open to the public on Zarembo Island. New roads that could be left open to public motorized use include Roads 52032, 52033, and 6594 with approximately 1.8, 5.4, and 2.4 miles, respectively, if a decision is made to keep these roads open.

Table 3-6

Miles of Road Potentially Available for Motorized Use in the Project Area and Percentage of Total Roads Open to Public on Zarembo Island by Alternative

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Miles of New and Reopened System Roads in the Project Area[1/]	0.0	10.6	12.8	5.2	11.7
Total Miles of Road Open to Motorized use if New Roads are Left Open (Option A)	7.8	18.4	20.6	13.0	19.5
Total Miles of Road Open to Motorized use if New Roads are Closed (Option B)	7.8	7.8	7.8	7.8	7.8
Percent Increase in Project Area Roads Under Option A	0.0	135.9	164.1	66.7	150.0
Percent Increase in Total Drivable Miles on Zarembo Island if Roads are Left Open [2/]	0.0	9.9	11.9	4.8	10.8

1/ These totals for Alternatives 1 through 5 include 1 mile of existing but impassable road (Road 6594 beyond Snail Creek) that would be reopened.

2/ Approximately 107 miles of road were open to motorized use on Zarembo Island in 1998 (including 4.7 miles of road only passable to ATVs).

The primary effect on access from these roads would be an increase in the areas available for cable logging. If the roads remain open to the public, there would also be an expansion of the area that hunters can reach by vehicle. Hunters that prefer to hunt areas accessible by vehicle would use the new roads, and would likely take advantage of these new roads to access higher elevations. Hunters that currently walk into some of the higher portions of the Project Area may go to other places for remote hunting experiences. Hunting and other road-related disturbance could have an adverse impact on species sensitive to human disturbance, such as nesting murrelets and goshawks, denning wolves, and elk. Even closed roads would increase walking use of the area, which could increase hunting pressure.

If all of the roads were to be closed to public vehicle use, there would be fewer hunters in the areas that the roads would access. Some ATVs may use the roads and some people would walk or bicycle the closed roads. Although closing the roads would result in less use of the areas than leaving them open, even closed roads would increase use of the Project Area compared to existing use. The Nesbitt high country area is likely to have increased use even if the road is closed because the road would improve foot access.

3 Issue 2: Road Access Management

Road Management Options

Option A— Leave all system roads open following the sale. Roads would be stormproofed by providing drivable waterbars/rolling dips. Roads would be routinely inspected and maintenance would be performed as needed. Costs shown in Table 3-7 for Option A include periodic brushing needed to perform drainage structure maintenance, including slide and ditch maintenance as needed. All temporary roads would be closed and natural drainage will be restored.

Option B—Existing open roads would remain open.

- Road 6594, MP 5.45 to 7.47 (the junction with Road 52032): Storm proof by providing drivable waterbars/rolling dips. Install a berm as an effective barrier to passenger and high clearance vehicles at stream crossing near MP 5.45. (Note: New road construction begins at MP 6.36, approximately 1 mile of existing system road is currently impassable.)
- Road 6594, MP 7.47 to 8.73: Place road in storage. Remove or bypass culverts, add cross drains and waterbars as needed.
- Road 52032, MP 0.00 to 1.82: Place road in storage. Remove or bypass culverts, add cross drains and waterbars as needed.
- Road 52033, MP 0.00 to 5.39: Close road by removing drainage structures, placing barrier boulders at the stream crossing (MP 0.82), and by placing a barrier berm at the junction with Road 6594 (MP 0.0 on Road 52033). Enforce road closure by a Road Order prohibiting motorized use. Road would be gated during logging. No motorized access would be allowed between April 1 and December 31.
- All temporary roads would be closed and natural drainage will be restored.

Costs shown in Table 3-7 for Option B include pulling culverts after the initial entry, reinstalling culverts as required for the next entry, and gating, where applicable. Where roads are closed but the drainage structures are left in place, costs include gating the road and sufficient road maintenance to access drainage structures for maintenance.

Table 3-7
Road Management Cost Comparison for Alternative 2

Road	Option A	Option B
6594 (MP 6.36 to 7.47)	23,469	16,383
6594 (MP 7.47 to 8.73)	26,640	38,910
52032	38,480	56,204
52033	113,961	169,336
Total Cost	**202,550**	**280,834**

Note: Costs are expressed in 1998 dollars using a 4% discount rate.

A comparison of the costs for maintaining the roads open (Option A) versus decommissioning or storage (Option B) is shown in Table 3-7. Components of the alternative options take place at different times. Stormproofing, for example, would take place in year 1, maintenance costs would be incurred annually, decommissioning or storage would likely take place in year 5, while stored roads are assumed to be reopened in year 30. In order to express these costs in a common measure, it is necessary to derive a *present value* by discounting all the costs back to year 0. The costs presented in Table 3-7, discounted using the standard Forest Service discount rate of 4 percent, are expressed in 1998 dollars. Documentation for this analysis is presented in Appendix F. Costs have been updated since the Draft EIS to reflect most current Region 10 Forest Service costs for doing such work.

Alternative 3 (Proposed Action)

Alternative 3 would construct approximately 11.8 miles of new system roads and reconstruct 1 mile of existing road. The primary difference between Alternative 3 and Alternative 2 would be building Road 52034 to access the upper Middle Meter Bight drainage, an area with high elk use and marbled murrelet nesting habitat (discussed under Issue 3: Wildlife). New roads that could be left open to public motorized use include Roads 52032, 52033, 52034, and 6594 with approximately 1.8, 5.4, 2.2, and 2.4 miles, respectively, if a decision is made to keep these roads open.

Road Management Options

Option A— Leave all system roads open following the sale. Roads would be stormproofed by providing drivable waterbars/rolling dips. Roads would be routinely inspected and maintenance would be performed as needed. Costs shown in Table 3-8 for Option A include periodic brushing needed to perform drainage structure maintenance, including slide and ditch maintenance as needed. All temporary roads would be closed and natural drainage will be restored.

Option B—Existing open roads would remain open.

- Road 6594, MP 5.45 to 7.47 (the junction with Road 52032): Storm proof by providing drivable waterbars/rolling dips. Install a berm as an effective barrier to passenger and high clearance vehicles at stream crossing near MP 5.45. (Note: New road construction begins at MP 6.36, approximately 1 mile of existing system road is currently impassable.)
- Road 6594, MP 7.47 to 8.73: Place road in storage. Remove or bypass culverts, add cross drains and waterbars as needed.

- Road 52032, MP 0.00 to 1.82: Place road in storage. Remove or bypass culverts, add cross drains and waterbars as needed.
- Road 52033, MP 0.00 to 5.39: Close road by removing drainage structures, placing barrier boulders at the stream crossing (MP 0.82), and by placing a barrier berm at the junction with Road 6594 (MP 0.0 on Road 52033). Enforce road closure by a Road Order prohibiting motorized use. Road would be gated during logging. No motorized access would be allowed between April 1 and December 31.
- Road 52034, MP 0.00 to 2.20: Place road in storage. Remove or bypass culverts, add cross drains and waterbars as needed.
- All temporary roads would be closed and natural drainage will be restored.

A comparison of the costs for maintaining the roads open (Option A) versus decommissioning or storage (Option B) is shown in Table 3-8. Components of the alternative options and the present value analysis are discussed under Alternative 2. Documentation for this analysis is presented in Appendix F.

Table 3-8
Road Management Comparison for Alternative 3

Road	Option A	Option B
6594 (MP 6.36 to 7.47)	23,469	16,383
6594 (MP 7.47 to 8.73)	26,640	38,910
52032	38,480	56,204
52033	113,961	169,336
52034	46,515	67,939
Total Cost	**249,065**	**348,772**

Note: Costs are expressed in 1998 dollars using a 4% discount rate.

Alternative 4

Compared to the other action alternatives, Alternative 4 would have less road building and less clearcutting in the Nesbitt drainage in an effort to reduce the adverse effects on deer habitat and subsistence hunting, as well as goshawk habitat. Approximately 4 miles of new system road would be constructed and 1 mile of existing road would be reconstructed. Under Alternative 4, Road 52033 would not be extended into the Nesbitt drainage, as would occur under Alternatives 2 and 3. Also, Road 52034 would not be built into the upper Middle Meter Bight drainage, as would occur under Alternative 3. If the roads are left open for public use, approximately 1.8 mile of Road 52032 and 2.2 miles of Road 6594 would be available.

The area west of Nesbitt Creek would not be roaded under Alternative 4. Most areas with suitable timber would be accessed using helicopters. Hunters would

not be able to access this area using motor vehicles. The area would continue to only be available to those that hike into unroaded areas.

Road Management Options

Option A—Leave all system roads open at the time. Roads would be stormproofed by providing drivable waterbars/rolling dips. Roads would be routinely inspected and maintenance would be performed as needed. Costs shown in Table 3-9 for Option A include periodic brushing needed to perform drainage structure maintenance, including slide and ditch maintenance as needed. All temporary roads would be closed and natural drainage will be restored.

Option B—Existing open roads would remain open.

- Road 6594, MP 5.40 to 7.47: Storm proof by providing drivable waterbars/rolling dips. Control roadside brush. Install a berm as a effective barrier to passenger and high clearance vehicles at a stream crossing near MP 5.4. (Note: New road construction begins at MP 6.36, approximately 1 mile of existing road is currently impassable.)
- Road 6594, MP 7.47 to 8.73: Place road in storage. Remove or bypass culverts, add cross drains and waterbars as needed.
- Road 52032, MP 0.00 to 1.82: Place road in storage. Remove or bypass culverts, add cross drains and waterbars as needed.

A cost comparison of the two road management options is presented by road in Table 3-9. Components of the alternative options and the present value analysis are discussed under Alternative 2. Documentation for this analysis is presented in Appendix C.

Table 3-9
Road Management Comparison for Alternative 4

Road	Option A	Option B
6594 (MP 6.36 to 7.47)	23,469	16,383
6594 (MP 7.47 to 8.73)	26,640	38,910
52032	38,480	56,204
Total Cost	**88,589**	**111,498**

Note: Costs are expressed in 1998 dollars using a 4 percent discount rate.

Alternative 5

The effects of Alternative 5 on access would be similar to Alternative 3, except that less road would be built into the Nesbitt area at this time. Compared to Alternatives 2 and 3, Alternative 5 would have less road building and less timber

harvest in the Nesbitt drainage, which would reduce the adverse effects on deer habitat and subsistence hunting. New roads that could be left open to public motorized use include Roads 52032, 52033, 52034, and 6594 with approximately 1.8, 4.3, 2.2, and 2.4 miles, respectively, if a decision is made to keep these roads open.

Road Management Options

Option A— Leave all system roads open at the time. Roads would be stormproofed by providing drivable waterbars/rolling dips. Roads would be routinely inspected and maintenance would be performed as needed. Costs shown in Table 3-10 for Option A include periodic brushing needed to perform drainage structure maintenance, including slide and ditch maintenance as needed. All temporary roads would be closed and natural drainage will be restored.

Option B—Existing open roads would remain open.

- Road 6594, MP 5.40 to 7.47: Storm proof by providing drivable waterbars/rolling dips. Control roadside brush. Install a berm as a effective barrier to passenger and high clearance vehicles at a stream crossing near MP 5.4. (Note: New road construction begins at MP 6.36, approximately 1 mile of existing road is currently impassable.)
- Road 6594, MP 7.47 to 8.73: Place road in storage. Remove or bypass culverts, add cross drains and waterbars as needed.
- Road 52032, MP 0.00 to 1.82: Place road in storage. Remove or bypass culverts, add cross drains and waterbars as needed.
- Road 52033, MP 0.00 to 5.39: Close road by removing drainage structures, placing barrier boulders at the stream crossing (MP 0.82), and by placing a barrier berm at the junction with Road 6594 (MP 0.0 on Road 52033). Enforce road closure by a Road Order prohibiting motorized use. Road would be gated during logging. No motorized access would be allowed between April 1 and December 31.
- Road 52034, MP 0.00 to 2.20: Place road in storage. Remove or bypass culverts, add cross drains and waterbars as needed.

A cost comparison of the two road management options is presented by road in Table 3-10. Components of the alternative options and the present value analysis are discussed under Alternative 2. Documentation for this analysis is presented in Appendix F.

Table 3-10
Road Management Comparison for Alternative 5

Road	Option A	Option B
6594 (MP 6.36 to 7.47)	23,469	16,383
6594 (MP 7.47 to 8.73)	26,640	38,910
52032	38,480	56,204
52033	90,703	135,367
52034	46,515	67,939
Total Cost	**225,807**	**314,803**

Note: Costs are expressed in 1998 dollars using a 4 percent discount rate.

Summary

Alternative 1 (No Action) would have the least adverse impacts to wildlife, including deer, but it would not improve access for timber management in the Project Area. It would not affect access for subsistence hunting.

Of the action alternatives, Alternative 3 would provide the best access for timber management followed by Alternative 5, which would only build part of Road 52033 at this time. Alternative 2 would build all of Road 52033 but it would not build Road 52034 into the Middle Meter Bight drainage. This area, which is suitable for cable yarding would be yarded using a more expensive helicopter-yarding system. Alternative 4 would provide the poorest access, requiring large areas suitable for cable yarding to be harvested using a helicopter. However, Alternative 4 would have the least impact on wildlife, followed by Alternatives 5 and 2. Alternative 3 would have the greatest impact on wildlife (see Issue 3).

Under all action alternatives, Option A would be the most cost-effective method of providing access for timber management. However, Option B would be preferable because it would minimize adverse impacts to wildlife. Access for subsistence hunting would improve somewhat, since hunters could hike the closed roads and may access some roads using ATVs. Closing new roads to passenger vehicles and high clearance vehicles would not appear to be an adverse impact to subsistence hunting.

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Issue 3: Wildlife Habitat

Alaska's wildlife are valuable for esthetic, economic, recreational, ecological, and subsistence reasons. Over 350 species of mammals (including marine mammals), birds, reptiles, and amphibians are known to occur on the Tongass National Forest, many of which occur on Zarembo Island and within the Project Area.

The Forest Plan contains a comprehensive conservation strategy to assure long-term species viability (TLMP FEIS, 1997; pages 3-11 through 3-26 and Appendix N). The TLMP ROD (1999) incorporated additional project-level standards and guidelines to strengthen species' protection. Both the conservation strategy and the additional ROD standards and guidelines are incorporated here by reference.

Many wildlife species depend on mosaics of unproductive and productive old-growth and late successional forest conditions. The conservation strategy provides a network of old-growth reserves to provide for these species. Connections between these tracts of forest (i.e., corridors) are an important component in the conservation strategy adopted by the Forest Plan (TLMP FEIS, 1997). The location and habitat quality of corridors linking the old growth reserves east and west of the Project Area are important issues in the design of this timber sale.

Species considered in this analysis include ESA-listed threatened and endangered species, Forest Service sensitive species, Forest Service Management Indicator Species (MIS), species of interest (former USFWS candidate species), and other key species (e.g., harvested species). Key species considered in the design of the alternatives include Sitka black-tailed deer, northern goshawk, marbled murrelet, Alexander archipelago wolf, and black bear.

The location, density, and use of roads has an effect on the quality of wildlife security habitat for certain species. Roads can affect dispersal patterns for low-mobility species such as invertebrates, amphibians, and some small mammals. Roads can increase human access to game and fur-bearing animals. Road access has been identified as an issue for species such as wolves.

Old-Growth Forest

Old-growth forests are ecosystems distinguished by stands containing old and large trees and related structural attributes (TLMP FEIS, 1997). Old growth encompasses the later stages of stand development, which typically differ from earlier stages in a variety of ways: larger tree sizes and more variation in size and spacing; large, dead standing or fallen trees; broken or deformed tops, bole and root decay; multiple canopy layers; and canopy gaps and understory patchiness (TLMP FEIS, 1997). The old-growth forest resource of the Tongass National Forest can be characterized in a number of ways. In a very general way, old-growth forests can be divided into a productive and an unproductive

component, based on the ability of specific areas to grow trees of a certain size (TLMP FEIS, 1997). Productive old-growth forest is divided into three strata: (1) high-volume old-growth forest; (2) medium-volume old-growth forest; and (3) low-volume old-growth forest. These categories are defined in the Vegetation section of Chapter 3 and displayed in Figure 3-1.

Zarembo Island is in the Etolin Island and Vicinity ecological province of Tongass National Forest (TLMP FEIS, 1997). Twelve percent of old-growth forest in this ecological province was harvested between 1954 and 1995. Twenty percent of the old-growth forest on Zarembo Island was harvested between 1954 and 1995 (TLMP FEIS, 1997). As part of the conservation strategy, the 14,450-acre Snow Pass medium old growth reserve has been established on the west side of the Project Area and the 15,250-acre Round Point medium old growth reserve has been established on the east side of the Project Area.

Approximately 1,141 acres in 23 harvest units were previously harvested in the Project Area. If one assumes that these acres were all medium-volume or high-volume old-growth forest prior to harvest, then under historical conditions, the Project Area had 6,963 acres of medium/high-volume old-growth forest and 3,509 acres of low-volume old-growth forest. This would mean that approximately 11 percent of the productive old growth within the Project Area has been harvested.

The Project Area currently has approximately 1,308 acres of high-volume old-growth forest, approximately 4,514 acres of medium-volume old-growth forest, and approximately 3,514 acres of low-volume old-growth forest (Table 3-11).

Most high-volume old-growth forest is in four locations: the upper Nesbitt Creek watershed, the upper Mustang Creek watershed, the middle and upper Vial Creek watershed, and the upper Middle Meter Bight watershed (Figure 3-1). Most medium-volume old-growth forest is in the same four geographic areas as the high-volume forest, (i.e., upper Nesbitt Creek, upper Mustang Creek, middle and upper Vial Creek, and upper Middle Meter Bight) (Figure 3-1). Low-volume old-growth forest is found in patches throughout the Project Area, but generally occurs along streams and on a few south-facing slopes (Figure 3-1).

The natural distribution of productive old-growth forest on Zarembo Island is quite patchy, being fragmented by muskeg, scrub-shrub wetlands, and forested wetlands (Figure 3-1). Under historical conditions, the Project Area had 42 patches of medium/high-volume old-growth forest (Table 3-11). Most patches were in the 0 to 15-acre (13) and 15.1 to 100-acre (17) categories. One patch was in the 600.1 to 1,000-acre category, and two patches were greater than 1,000 acres. The largest patch was approximately 2,048 acres.

Timber harvest has further fragmented the old-growth forest in certain areas (e.g., upper Mustang Creek, upper Nesbitt Creek). The Project Area currently has 75 patches of medium/high-volume old-growth forest (Table 3-11). Most

Skipping Cow Timber Sale EIS

Figure 3-1
Productive Old Growth
Existing Conditions
Alternative 1

May 16, 2000

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Table 3-11

Wildlife Habitat in the Project Area (Historical, Current, and Post-Harvest Under All Action Alternatives)

	Historical	Current	Alternative 2		Alternative 3		Alternative 4		Alternative 5	
	Conditions[1/]	Conditions	Post-Harvest	% Change	Post-Harvest	% Change	Post-Harvest	% Change	Post-Harvest	% Change
Old Growth (OG) Forest										
Acres of High Volume OG	1,308	1,308	1,133	-13.4	1,134	-13.4	1,055	-19.3	1,186	-9.3
Acres of Medium Volume OG	5,703	4,515	3,667	-18.8	3,686	-18.3	3,694	-18.2	3,806	-15.7
Acres of Low Volume OG	3,509	3,514	3,442	-2.0	3,442	-2.0	3,766	+7.2	3,475	-1.1
OG Forest Fragmentation										
Acres of Edge Forest (H/M Volstr.)	4,952	4,149	3,957	-4.6	3,953	-4.7	3,900	-6.0	3,964	-4.5
Acres of Interior Forest (H/M Volstr.)	2,059	1,674	843	-49.6	867	-48.2	849	-49.3	1,028	-38.6
Edge/Interior Ratio	2.41	2.48	4.69		4.56		4.59		3.86	
OG Forest Patch Analysis										
Total No. of H/M Volstr. Patches	42	75	117	+56.0	116	+54.6	81	+8.0	111	+48.0
No. Patches, 0 - 15 acres	13	40	77	+92.5	76	+90.0	44	+10.0	73	+82.5
No. Patches, 15.1 - 100 acres	17	23	28	+21.7	28	+21.7	23	0.0	26	+13.0
No. Patches, 100.1 - 600 acres	9	10	11	+10.0	11	+10.0	12	+20.0	11	+10.0
No. Patches, 600.1 - 1,000 acres	1	1	1	0.0	1	0.0	2	+100.0	1	0.0
No. Patches, > 1,000 acres	2	1	0	-100.0	0	-100.0	0	-100.0	0	-100.0
Acreage of Largest Patch	2,048	1,576	694	-56.0	694	-56.0	891	-43.5	985	-37.5
Northern Goshawk Habitat[2/]										
Acres of High Value Habitat	3,070	2,308	2,226	-3.6	2,229	-3.4	2,239	-3.0	2,244	-2.8
Marbled Murrelet Habitat[3/]										
Acres of High Value Habitat	6,963	5,823	4,800	-17.6	4,820	-17.2	5,528	-5.1	4,992	-14.3
Black Bear Habitat, Option A[4/]										
Acres of Low Value Habitat	406	648	648	0	648	0	648	0	648	0
Acres of Medium Value Habitat	19,108	18,913	23,017	+21.2	23,017	+21.7	22,688	+20.0	22,935	+21.5
Acres of High Value Habitat	6,226	6,179	2,075	-66.4	2,075	-66.4	2,404	-61.1	2,157	-65.1
Black Bear Habitat, Option B[4/]										
Acres of Low Value Habitat	406	648	648	0	648	0	648	0	648	0
Acres of Medium Value Habitat	19,108	18,913	20,175	+6.7	20,175	+6.7	19,177	+1.4	19,902	+5.2
Acres of High Value Habitat	6,226	6,179	4,917	-20.4	4917	-20.4	5,915	-2.9	5,190	-16.0
Black-tailed Deer Habitat[4/]										
Acres of Low Value Habitat	20,856	20,858	21,050	+0.9	21,043	+0.9	21,134	+0.7	21,004	+0.7
Acres of Medium Value Habitat	3,481	3,479	3,316	-4.7	3,322	-4.5	3,256	-2.8	3,361	-3.4
Acres of High Value Habitat	1,403	1,403	1,374	-2.1	1,375	-2.1	1,350	-3.3	1,375	-2.0

1/ Assumes that all 1,141 acres of harvested forest in Project Area was medium-volume old-growth prior to harvest.

2/ High value goshawk habitat: medium and high volume strata old growth forest on slopes less than 35 percent and below 800 feet elevation.

3/ High value marbled murrelet habitat: medium and high volume strata old growth forest.

4/ For black bear habitat and black-tailed deer habitat: Acres of low value habitat: HS1 values between 0 and 0.39; Acres of medium value habitat: HS1 values between 0.4 and 0.59; Acres of high value habitat: HS1 values over 0.6.

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patches are in the 0 to 15-acre (40) and 15.1 to 100-acre (23) categories. One patch is in the 600.1 to 1,000-acre category, and one patch is larger than 1,000 acres. The largest patch is 1,576 acres.

Low elevation passes, beach fringe, and stream corridors provide natural connections between forested blocks and are important areas for migrating and dispersing wildlife. These areas can become pinch-points to wildlife species if they provide the only movement route between two blocks of forest. Corridors can be protected by not harvesting within them or by managing the matrix of habitat between the reserves (Suring et al., 1993). Under the Forest Plan, maintaining forested corridors between old growth reserves is a key component of the conservation strategy for maintaining viable wildlife populations on the Tongass National Forest because the majority of the habitat matrix between the reserves is scheduled to be harvested through time (TLMP FEIS, 1997).

In general, the beach fringe zone is believed to be an important wildlife travel corridor, providing low-elevation connectivity between watersheds that are separated by very steep sides and non-forested ridgetops. Riparian areas are frequently important travel corridors within watersheds, while forested corridors along slopes are used for the seasonal movement of certain wildlife species between summer and winter range. Low-elevation passes are used by wildlife for movement between watersheds.

Within the Project Area, the principal concern is maintaining an effective wildlife corridor connecting the Snow Pass Old Growth Reserve to the west and the Round Point Old Growth Reserve to the east of the Project Area (Figure 3-1). The effectiveness of the beach fringe as a travel corridor for some old-growth-dependent species has been reduced by past clearcutting within the beach fringe. Riparian corridors in the Project Area are generally oriented in a north-south direction. The principal north-south stream corridors are Nesbitt Creek and Vial Creek, neither of which has been substantially impacted by timber harvest to date. The Nesbitt Creek-Mustang Creek drainage appears to be the most important corridor for north-south movement of wildlife in the Project Area. The East Fork of Nesbitt Creek and tributaries west of Nesbitt Creek are oriented in a more east-west direction and, therefore, are likely to be the most effective corridors for wildlife movement between the two Old Growth Reserves (Figure 3-1). Small mammal trapping surveys (USDA Forest Service, 1997d) and deer pellet count surveys (Elze and Posner, 1997) have been completed for much of the area. They indicate that old-growth stands in the vicinity of the corridor are being used by small mammals and deer. However, this corridor is limited by natural features, such as topographic breaks and wetlands. It is less than 1,000 feet wide in many places, there are short breaks in the old growth forest, and it is bisected by an existing road (Road 6594).

Old-Growth Forest Effects

Effects on productive old-growth forest habitat were assessed by comparing the current acreage of low-, medium-, and high-volume old-growth forest in the Project Area with the predicted acreage of these old-growth forest categories after implementation of each action alternative. For Alternatives 2, 3, and 5, all harvest was modeled in GIS as clearcut harvest. For Alternative 4, selective harvest in Nesbitt Creek harvest units was assumed to mean selective removal of one-quarter of the trees over 9-inches DBH according to diameter-class/elevation rules that would result in relatively even distribution of harvest throughout each unit. Accordingly, harvest was modeled in GIS by converting the majority of existing high-volume forest to medium-volume forest and the majority of existing medium-volume forest to low-volume forest (in a few harvest units, removal of 25 percent of the trees over 9 inches DBH was judged not to result in a change in volume stratum).

The acreage of high-volume old-growth forest would decrease a moderate amount in each action alternative (Table 3-11 and Figures 3-2 through 3-5). The greatest decrease would be in Alternative 4 (253 acres, 19.3 percent), while the smallest decrease would be in Alternative 5 (122 acres, 9.3 percent) (Table 3-11). The acreage of medium-volume old-growth forest would also decrease in each action alternative. The greatest decrease would be in Alternative 2 (847 acres, 18.8 percent), while the smallest decrease would be in Alternative 5 (708 acres, 15.7 percent) (Table 3-11). The amount of low-volume old-growth forest decreases slightly in each action alternative (ranging from 1.1 to 2.0 percent), except for Alternative 4, where low-volume old-growth forest actually increases because of the manner in which harvest was modeled. Considering medium- and high-volume old-growth forest together, Alternative 4 has the greatest decrease in acreage, from 5,822 to 4,749 acres (1,073 acres, 18.4 percent). Alternative 5 has the smallest decrease of acreage, from 5,822 to 4,993 acres (830 acres, 14.3 percent).

Fragmentation of productive old-growth forest in the Project Area was assessed by comparing the current status of three parameters against predicted conditions after implementation of each action alternative. These parameters included the number and size distribution of combined medium/high-volume old-growth forest patches and the amount of edge forest and interior forest in the combined medium/high-volume categories.

The total number of medium/high-volume old-growth forest patches increases from 48 to 56 percent in Alternatives 2, 3, and 5. Alternative 4 had a slight increase, owing to the manner in which harvest was modeled for this alternative (Table 3-11). The increases are due solely to the division of larger patches into two or more smaller patches. The size distribution of forest patches also changes substantially in all action alternatives except Alternative 4, due largely to a substantial increase (82.5 to 92.5 percent) in the number of patches in the 0 to 15-acre category and a moderate increase (13.0 to 21.7 percent) in the number of patches in the 15.1 to 100-acre category in Alternatives 2, 3, and 5. Alternative 4

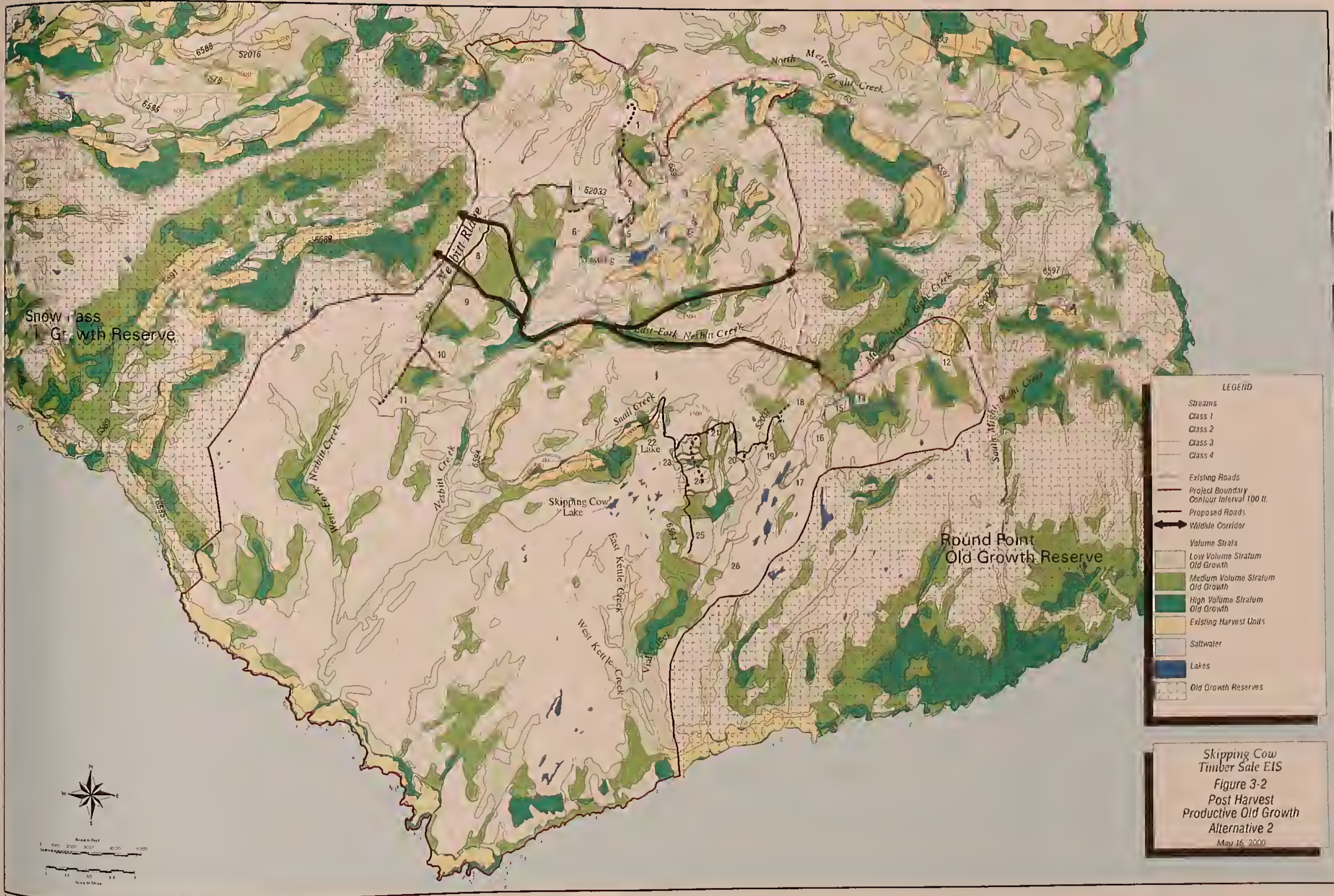
has only a slight increase in the number of 0 to 15-acre patches, and no increase in the number of 15.1 to 100-acre patches.

At present, the largest medium/high-volume old-growth forest patch in the Project Area is 1,576 acres. Maximum patch size decreases substantially in all action alternatives (Table 3-11). The greatest decrease is in Alternatives 2 and 3 (maximum patch size of 694 acres, a decrease of 56 percent), while the smallest decrease is in Alternative 5 (maximum patch size of 985 acres, a decrease of 37.5 percent).

In summary, Alternatives 2 and 3 produce the greatest amount of forest fragmentation, as measured by the increase in number of old-growth forest patches and the decrease in maximum patch size. Forest fragmentation in Alternative 5 is similar to Alternatives 2 and 3, except that maximum patch size in Alternative 5 is greater than all other alternatives. Alternative 4 would result in the least forest fragmentation because it has the smallest increase in the number of old-growth patches and the second-smallest decrease in maximum patch size. Increased forest fragmentation and reductions in the amount of old-growth forest patch size are generally considered detrimental to species which require old-growth forest habitat for survival and reproduction. Fragmentation tends to isolate old-growth species of low mobility, thereby increasing their susceptibility to local population extirpation.

Maintaining wildlife corridors between the 14,450-acre medium old growth reserve west of the Project Area (Snow Pass Old Growth Reserve) and the 15,250-acre medium old growth reserve to the east (Round Point Old Growth Reserve) would contribute to their effectiveness as old growth reserves by fostering population (and, therefore, genetic) interchange of old-growth species between the reserves. Corridors may also provide additional predator escape/avoidance options for deer and elk. At present, the Old Growth Reserves are not completely connected with one another by productive old-growth forest. Old-growth forest in east- and west-trending riparian corridors along the East Fork of Nesbitt Creek, a portion of Nesbitt Creek east of proposed Unit 9, and tributaries west of Nesbitt Creek provide the most complete linkage (Figure 3-1).

All alternatives call for maintenance of wildlife corridors between the old growth reserves in the form of the beach fringe zone (which will develop into a more effective corridor as forest regeneration advances to the old-growth stage) and east- and west-trending, forested riparian corridors through the middle Nesbitt Creek area. In addition, the reserves would remain broadly connected with one another in the low-elevation, gently-sloping southern portion of the Project Area under all action alternatives. The action alternatives have been designed to reduce adverse effects on the principal east- and west-trending riparian corridors in the Project Area. Specifically, harvest units would avoid the principal east-west riparian corridors, and mitigation measures (e.g., stream buffers, and tree retention measures) would be included to reduce harvest effects on possible movement corridors within or adjacent to harvest units. However, even under Alternative 1, no unbroken old growth corridor at least 1,000 feet



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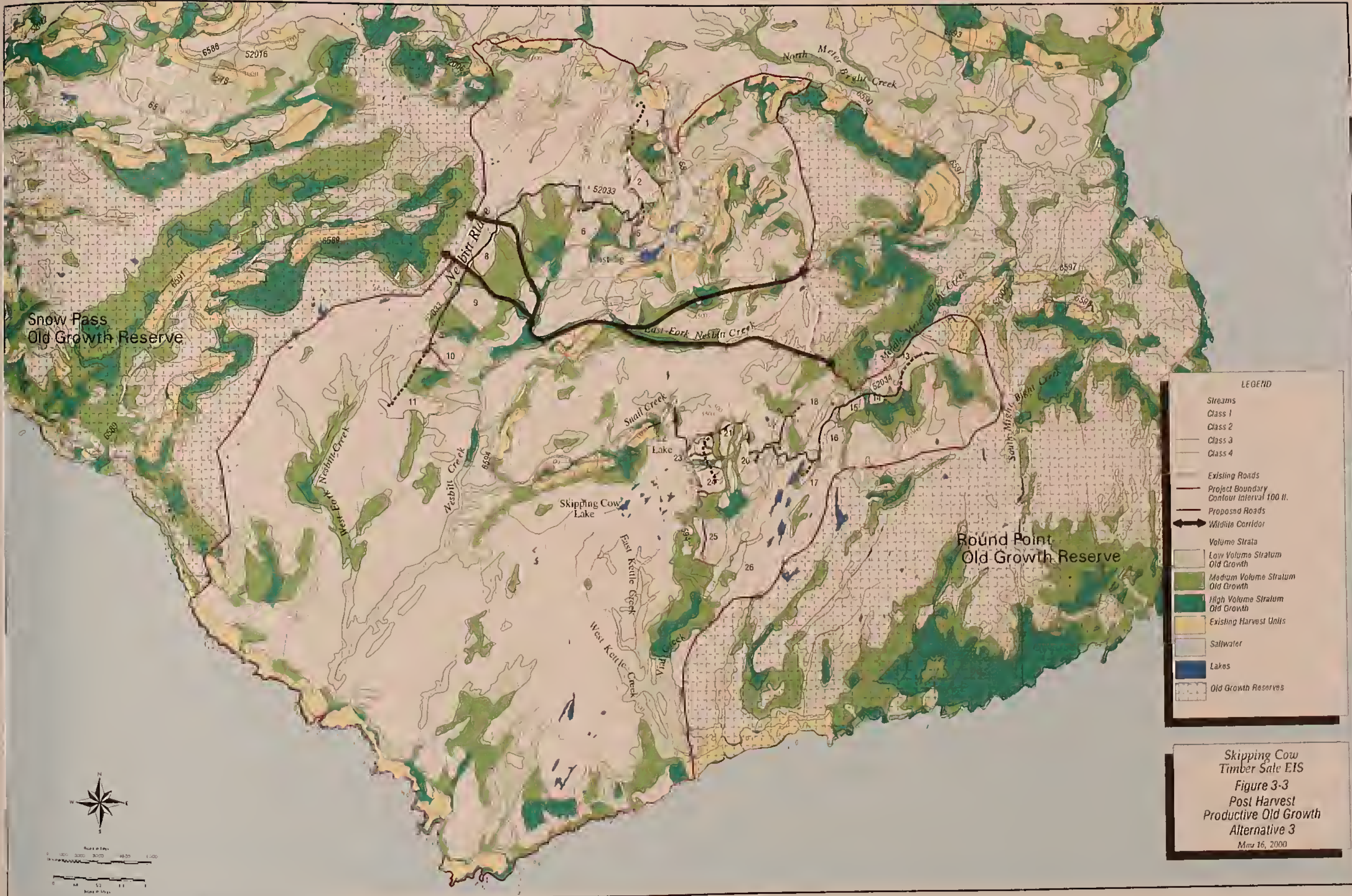

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Skipping Cow Timber Sale EIS

Figure 3-4
Post Harvest
Productive Old Growth
Alternative 4

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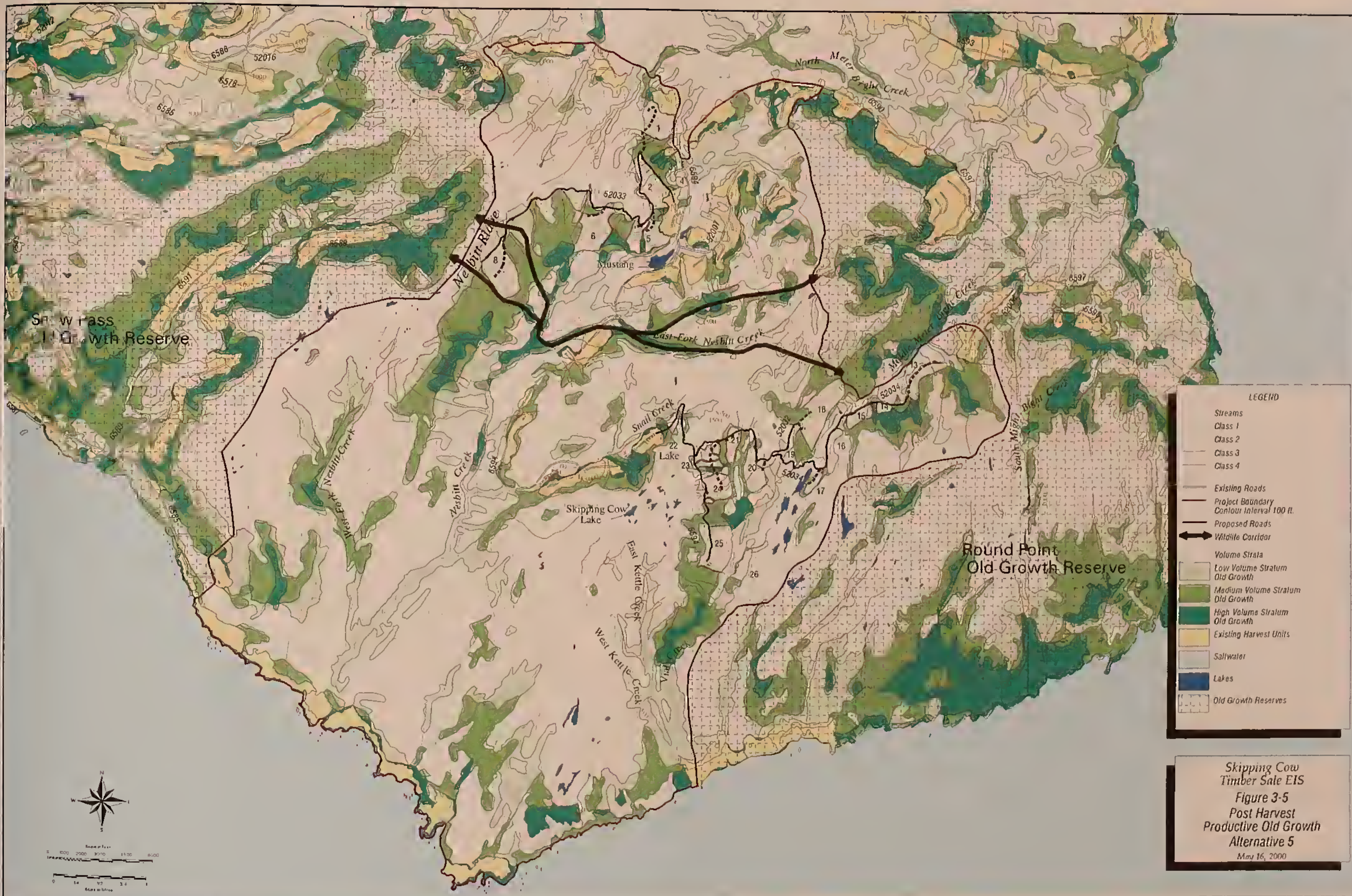

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wide exists (Figure 3-1). Units were not located near narrow points and natural breaks in the corridor in order to retain its ability to provide connectivity for wildlife.

In Alternatives 2 and 3, harvest units 8 and 9 in the Nesbitt Creek drainage have been spatially separated in order to retain forested corridors for wildlife movement. However, the road to be constructed in the upper Mustang Creek drainage and along the ridge above Nesbitt Creek may be a physical barrier to movement for some low-mobility, species associated with old growth. In addition, noise and activity associated with road use may be a behavioral barrier to movement for some disturbance-sensitive species. In Alternative 5, harvest units in the Nesbitt Creek drainage would not restrict the corridor, and the road would be constructed only about half-way along the ridge above Nesbitt Creek. In Alternative 4, the selective-cut harvest prescription for units in the Nesbitt Creek drainage would allow for continued movement of wildlife through the units themselves in many places. In addition, no roads would be constructed along the ridge above Nesbitt Creek. Thus, wildlife corridors in the Nesbitt Creek drainage would be relatively less affected under Alternative 4 than under the other action alternatives. Environmental effects would be less under Alternative 5 than under Alternatives 2 and 3, because less road would be constructed in the upper Nesbitt Creek drainage under Alternative 5 than under Alternatives 2 and 3. In summary, Alternative 1 would rank highest for connectivity, followed by Alternatives 4, 5, 2, and 3, which would rank lowest for providing connectivity.

Wildlife Species

This section addresses the key wildlife species within the Project Area on Zarembo Island. Emphasis is placed on ESA-listed threatened and endangered species, species of interest (former USFWS candidate species), Forest Service sensitive species, Forest Service MIS, and other key species. Threatened, endangered, and sensitive species are addressed in the Biological Evaluation (BE) and Biological Assessment (BA) for the Forest Plan and in the BE and BA for this project. These documents are incorporated here by reference. Special emphasis is placed on Sitka black-tailed deer because of its importance to subsistence in the region. Some important wildlife species of Tongass National Forest—brown bear, marten, and mountain goat—are not known to occur on Zarembo Island.

Threatened and Endangered Species

American peregrine falcon (*Falco peregrinus anatum*), humpback whale (*Megaptera novaeangliae*), and Steller's sea lion (*Eumetopas jubatus*) are ESA-listed species that occur within the boundaries of Tongass National Forest in the vicinity of Zarembo Island. The American peregrine falcon passes through the

region on spring and fall migration flights but is not known to nest or forage in the Project Area. Humpback whales and Steller's sea lions are known to use the waters of Clarence Strait on the southwest side of Zarembo Island. No Steller's sea lion haul-outs are known on Zarembo Island itself.

Effects

Because these species are not known to breed or to have significant foraging activity in the Project Area, no significant adverse effects would be expected as a result of the Skipping Cow Timber Sale (Project BA, 1999).

Other Species of Interest

Four species of interest that may occur in the Project Area are discussed below (Table 3-12). These are former USFWS candidate species which no longer receive special protection under ESA.

Spotted Frog (Rana pretiosa)

Distribution of the spotted frog in Southeast Alaska is confined to coastal forests where it breeds in association with permanent bodies of water, including grassy margins of muskegs, lakes, and streams. During wildlife surveys in 1997 and 1998, Forest Service personnel searched for amphibians in several beaver ponds on Nesbitt Creek and around Mustang Lake, but none were located (Posner, 1998). If spotted frogs are found, their locations will be documented and a management decision will be made for the correct course of action.

Effects

Spotted frogs have not been documented in the Project Area. In addition, the action alternatives have been designed to minimize adverse effects on spotted frog habitats. Specifically, harvest units have been laid out to avoid the principal spotted frog habitats (ponds and streams), and mitigation measures have been included to reduce harvest effects on streams and riparian areas within or adjacent to harvest units. Thus, no substantive adverse effects to the spotted frog are anticipated under any of the action alternatives.

Marbled Murrelet (Brachyramphus marmoratus)

The marbled murrelet is a small seabird that is numerous and wide-spread throughout coastal waters of southeast Alaska. Murrelets feed on small fish and invertebrates in near-shore ocean areas, inland saltwater, and occasionally on inland freshwater lakes. During the breeding season, murrelets are more dispersed but will still concentrate in feeding areas during the day. Murrelets are highly mobile in their search for foraging areas, suggesting a high level of population interaction.

Table 3-12
List of Species in the Skipping Cow Project Area with Federal or State Status

Species	USFWS Status	ADF&G Status	Forest Service Status
Humpback whale	Endangered	Endangered	
American peregrine falcon	Endangered	Species of special concern	
Steller's sea lion	Threatened	Species of special concern	
Spotted frog[1/]			
Marbled murrelet[1/]		None in Alaska	Proposed Sensitive Species
Queen Charlotte goshawk[1/]		Species of special concern	Sensitive
Osprey			Sensitive
Peale's peregrine falcon			Sensitive
Trumpeter swan			Sensitive
Bald eagle			MIS
Alexander Archipelago wolf[1/]			MIS
Black bear			MIS
Brown creeper			MIS (OG)
Hairy woodpecker			MIS (OG)
Red squirrel			MIS (OG)
Red-breasted sapsucker			MIS (OG)
River otter			MIS
Sitka black-tailed deer			MIS
Vancouver Canada goose			MIS

[1/]Former USFWS candidate species which no longer receive special protection under ESA.

The marbled murrelet is listed as a threatened species in Washington, Oregon, and California, and is a species of concern in Alaska. The Forest Plan states "the listing of this species in Washington, Oregon, and California and the reductions in habitat from timber harvesting, have raised concerns for the viability of this species in Southeast Alaska" (TLMP FEIS, 1997). Although population trends for marbled murrelets in southeast Alaska are not well documented, there has been an estimated 50 percent decline over the last 20 years in the State. A similar 60 percent decline is reported for Clayoquot Sound in British Columbia during a 10-year period (Swanston et al., 1996).

Habitat requirements for nesting are poorly understood, but data from forested areas elsewhere within the range of the marbled murrelet indicate that stands of high-volume old growth coniferous forests near the coast are important nesting habitat. In southeast Alaska, six nests have been located to date: one on rock talus, one on overturned tree roots, and four in trees. All of the nests were at relatively low elevation, close to salt water, and within moderate to high volume old growth (Swanston et al., 1996).

The importance of beach and riparian areas to marbled murrelets is largely unknown. Some researchers have found a preference for riparian corridors, indicating that birds may be following streams (opening in the forest canopy) to the nest. Three nests on Prince of Wales varied in their distance from saltwater (0.3 mile, 3.9 miles, 8.1 miles). One study in Southeast Alaska reported the greatest amount of murrelet activity occurring between 1 and 7 kilometers (km) (0.62 and 4.34 miles, respectively) from the coast (DeGange, 1996). Riparian and beach fringe buffers, due to their linear nature and high amount of edge, may be less suitable for nesting (TLMP FEIS, 1997).

Single-tree, small group selection, or other harvest methods that maintain characteristics of old growth forest structure, rather than clearcutting, may maintain the types of stand structures within harvested areas that will support nesting murrelets. Long timber harvest rotations (over 200 years) may also sustain murrelet nesting habitat. Implementing a reserve-based strategy, such as the one implemented by TLMP (1997), particularly in those biogeographic provinces where past timber harvest has been concentrated and is projected to continue, should enhance the likelihood of maintaining well-distributed marbled murrelet habitat (Swanston et al., 1996).

The Forest Plan has implemented a two tier strategy to protect nesting habitat. Old growth habitat is protected in Old Growth Reserves, riparian buffers, and the beach fringe. A 600-foot-radius buffer is to be maintained around all known nest sites and timing restrictions limit disturbance during nesting season (TLMP, 1997). Roads can enter this buffer if unavoidable, but every effort should be made to protect the nest site. Road building and fragmentation of forested areas is thought to increase predation as a result of increased access to marbled murrelet nesting stands by avian predators, especially jays, crows, and ravens (DeGange, 1996).

A "coarse filter" analysis of GIS data layers was conducted to quantify the amount of suitable marbled murrelet habitat that currently exists in the Project Area. Suitable marbled murrelet habitat was defined as medium- and high-volume old-growth forest. The results are presented in Table 3-11, and are displayed in Figure 3-1. Approximately 5,822 acres of suitable marbled murrelet habitat currently exist in the Project Area. Most high value murrelet habitat is in four locations: (1) the upper Nesbitt Creek watershed, (2) the upper Mustang Creek watershed, (3) the middle and upper Vial Creek watershed, and (4) the upper Middle Meter Bight watershed (Figure 3-1). In addition, high- and medium-value murrelet habitat is protected within the adjacent old growth reserves.

Marbled murrelet surveys were conducted in the Project Area in June 1997 (Posner, 1998). Three stationary survey points were selected along Road 6594 in the middle and upper Nesbitt Creek drainage and at the end of Road 52004 in the Middle Meter Bight drainage. Murrelets were recorded at all four survey points. Murrelets were recorded flying by and calling six times at survey point #1 (southern bend in Road 6594), including murrelets that were observed circling

around the stand south of the survey point (circling indicates possible nesting behavior). Murrelets were recorded flying by three times at survey point #2 (previously-harvested area between survey points #1 and #3), and five times at survey point #3 (edge of previously-harvested area just southwest of Mustang Lake). Most marbled murrelet activity was recorded from survey point #4 at the end of Road 52004. Forty-five fly-bys of one or two murrelets were recorded in a two-hour time span. At least one pair was observed circling, indicating the possible presence of a nest. Most murrelets were observed flying up the main drainage and the drainage immediately south of the survey point (Posner, 1998).

Effects

Effects on marbled murrelets were assessed by comparing the current acreage of "suitable marbled murrelet nesting habitat" in the Project Area to the remaining acreage of suitable murrelet nesting habitat after implementation of each action alternative, and comparing current old-growth forest fragmentation with expected fragmentation after implementation of each action alternative. Suitable marbled murrelet nesting habitat, as defined above, is all medium- and high-volume old-growth forest in the Project Area.

Suitable marbled murrelet nesting habitat would decrease under all of the action alternatives (Table 3-11). The maximum decrease would be in Alternative 2 (1,023 acres, 17.6 percent), while the minimum decrease would be in Alternative 4 (295 acres, 5.1 percent) (Table 3-11). However, both Alternatives 2 and 4 would leave 25 percent of the trees over 9-inches DBH in high value nesting habitat. Therefore, most of the acres affected by harvest would retain some nesting habitat. Alternatives 3 and 5 do not include Unit 12. Therefore, they would harvest fewer acres of marbled murrelet habitat. Depending on the alternative selected, between 83 and 95 percent of the mid- to high-volume old growth in the Project Area would remain to augment habitat provided within the Round Point and Snow Pass Old Growth Reserves which border the Project Area.

Forest fragmentation would increase under all action alternatives. Increased forest fragmentation is likely to have adverse short-term effects to nesting marbled murrelets because it may lead to an increased potential for disturbance leading to higher stress levels or even nest abandonment and an increased susceptibility to predators. Alternatives 2 and 3 produce the greatest amount of forest fragmentation, as measured by the increase in number of old-growth forest patches and the decrease in maximum patch size (Table 3-11). Forest fragmentation in Alternative 5 is similar to Alternatives 2 and 3, except that maximum patch size in Alternative 5 is greater than all other alternatives. Alternative 4 would result in the least forest fragmentation because it has the smallest increase in the number of old-growth patches and the smallest decrease in interior forest.

Localized and temporary disturbance effects would be anticipated under all action alternatives as a result of road construction and timber harvest in the

vicinity of any active murrelet nests. Although there are no documented murrelet nest trees in the Project Area, suitable murrelet nesting habitat in the upper Nesbitt Creek drainage, the upper Mustang Creek drainage, the middle and upper Vial Creek drainage, and upper Middle Meter Bight drainage could be disturbed by timber harvest and/or road construction. Due to the number of sightings in the upper Middle Meter Bight drainage, it is recommended that disturbance be minimized in that area during nesting season (May 1 to June 15). This timing restriction has been included in the mitigation measures (see Chapter 2 and Appendix B). This restriction exceeds protection requirements mandated by the Forest Plan Standards and Guidelines. If nests are discovered, standards required by the Forest Plan would be implemented.

Queen Charlotte (Northern) Goshawk (Accipiter gentilis)

The northern goshawk inhabits forested lands throughout North America, favoring dense stands of conifer or deciduous old growth for nesting habitat (TLMP FEIS, 1997). The Queen Charlotte goshawk is recognized as a distinct subspecies found in the coastal areas of British Columbia and Southeast Alaska. The Queen Charlotte goshawk is a species of concern and a Forest Service sensitive species. Eighty-one percent of the confirmed and probable nest sites of this subspecies in Southeast Alaska are south of Frederick Sound. In Southeast Alaska, the goshawk appears to be non-migratory, although it may occupy different, or overlapping, breeding and winter territories (TLMP FEIS, 1997).

Concern exists over the viability of the goshawk population in Southeast Alaska, especially areas in which more than 33 percent of the productive old-growth forest habitat has been harvested (TLMP FEIS, 1997). In 1994, the USFWS received a petition to list the Queen Charlotte goshawk under the ESA. The USFWS decided not to list the goshawk at that time, and again in 1997, largely on the basis of protective measures included in the revised Forest Plan.

Goshawks make extensive use of productive old-growth forests for foraging and nesting in Southeast Alaska. In radio-tracking studies on the Tongass National Forest, 70.5 percent of goshawk relocations occurred in mature sawtimber or productive old-growth forest (Iverson et al., 1996). Iverson et al. (1996) reported that goshawks showed a strong pattern of selecting productive old growth forest compared to other cover types in productive old growth (volume greater than 8,000 board feet per acre) and only 1 percent of relocations were in young, second growth forests. Landscape factors such as slope and elevation along with beaches, riparian areas, and estuaries are important to goshawk habitat suitability. Goshawks appear to prefer forested low elevations areas with gentle slopes (Iverson et al., 1996). Riparian zones ranked as the most important landscape component used by radio-collared goshawks (Iverson et al., 1996). Radio-tracking results also indicate that goshawks make extensive use of areas within 1,000 feet of beaches and estuaries (Iverson et al., 1996). Estimates of

goshawk home range size vary considerably. Iverson et al. (1996) reported that both females and males use areas ranging from 9,469 to 11,425 acres.

Biologists located radio-collared goshawks on Zarembo Island in 1995 (Posner unpublished report, 1998). At least four telemetry relocations were made in the upper Nesbitt Creek portion of the Project Area in April and November 1995. Radio-collared goshawk locations were also recorded for the south end of the Project Area in 1992 (Posner, 1998). Thus, at a minimum, portions of the Project Area can be considered winter goshawk habitat.

Goshawk surveys were conducted in the Project Area in 1997 and 1998. Surveys were conducted according to Region 10 protocol in the majority of high-volume old-growth forest stands below 1,500 feet in elevation. These stands are in the upper Mustang Creek, upper Nesbitt Creek, upper Vial Creek, and upper Middle Meter Bight drainages. No goshawks were detected in 1997 or 1998 (Posner, 1998).

Approximately 2,308 acres of high value goshawk habitat currently exist in the Project Area (Table 3-11). Most habitat is located in upper Nesbitt Creek, middle and upper Vial Creek, upper Middle Meter Bight, West Fork of Nesbitt Creek, and in some very small watersheds at the south end of the island (corresponds to high-volume old growth, see Figure 3-1).

Effects

The Forest Plan provides a combination of old growth reserves and dynamic-landscape management to provide goshawk habitat. In addition to the old-growth strategy, the Forest Plan contains measures that address conservation concerns related to the Queen Charotte goshawk. The Forest Plan direction for maintaining goshawk habitat is discussed in Appendix N of the Forest Plan.

The Forest Plan examined the proportion of old growth forest remaining, after full implementation of the Forest Plan for 100 years, in each VCU that contains goshawk habitat. This analysis indicates that the proportion of old growth that will remain in 620 of the 678 VCUs (91 percent) is consistent with the conclusion that there is a high likelihood of sustaining goshawks.

Specific project effects on goshawks were assessed by comparing the current acreage of "high value goshawk nesting habitat" in the Project Area to the remaining acreage of high value goshawk nesting habitat after implementation of each action alternative. Also, current old-growth forest fragmentation was compared with fragmentation expected after implementation of each action alternative.

High value goshawk nesting habitat would decrease under all of the action alternatives (Table 3-11). The maximum decrease would be in Alternatives 2 and 3 (82 acres, 3.6 percent), while the minimum decrease would be in Alternative 5 (64 acres, 2.8 percent) (Table 3-11). There would be little difference among alternatives in the percentage decrease of high value goshawk

nesting habitat. No goshawk nests have been discovered. If nests are found during sale layout or harvest, Forest Plan Standards and Guidelines would be implemented to protect the nests.

Forest fragmentation would increase under all action alternatives. Increased forest fragmentation is likely to be reduce the potential for northern goshawks to nest in the area. Alternatives 2 and 3 produce the greatest amount of forest fragmentation, as measured by the increase in number of old-growth forest patches and the decrease in maximum patch size (Table 3-11). Forest fragmentation in Alternative 5 would be similar to Alternatives 2 and 3, except that the maximum patch size in Alternative 5 would be greater than in the other alternatives and there would be less fragmentation in the Nesbitt area. Alternative 4 results in the least forest fragmentation because it has the smallest increase in the number of old-growth patches and the second-smallest decrease in maximum patch size.

Localized and temporary disturbance effects would be anticipated under all of the action alternatives as a result of road construction and timber harvest in the vicinity of any active goshawk nests. Although there are no known goshawk nests in the Project Area, goshawk use areas could be disturbed by timber harvest activities in Units 1, 2, 3, 4, 9, and 10 and by road construction along the ridge above (north and west of) Nesbitt Creek in Alternatives 2 and 3. Other goshawk use areas in the Vial Creek drainage and upper Middle Meter Bight could be disturbed by timber harvest or road construction.

If a nest is located during sale activities, Forest Plan Standards and Guidelines would be implemented. An area of not less than 100 acres of productive old-growth forest (if it exists) would be maintained, centered around the known nest tree or probable nest site. No commercial timber harvest would be permitted in this buffer.

No significant effects on goshawk populations are expected as a result of the proposed alternatives. The project may impact individuals, but it is not likely to contribute towards the loss of viability to the population or the species due to the amount of habitat that would remain after the sale (Project BE, 1999).

Alexander Archipelago Wolf

Two Alaskan subspecies of the gray wolf are currently recognized. The subspecies found in Southeast Alaska is known as the Alexander Archipelago wolf (*Canis lupus ligoni*). It inhabits the mainland and the islands south of Frederick Sound. The total population is estimated at fewer than 1,000 individuals in all of Southeast Alaska, with approximately 200 being harvested annually (Kirchhoff, 1991). Although the wolf is listed as threatened in the contiguous 48 states, it is not listed in Alaska. It is a species of concern and a MIS on the Tongass National Forest. The Forest Service's commitment to revise its Forest Plan to protect old-growth forest was an important element in the USFWS's decision not to list the wolf in Alaska.

The Forest Plan identified three key factors that are important for maintaining wolf populations: maintaining adequate habitat for prey populations (primarily deer), controlling road density, and controlling road access to reduce illegal kills (TLMP FEIS, 1997). In addition, the small size of Zarembo Island (184 square miles) probably precludes multiple wolf packs. Wolf packs frequently have home ranges of 100 square miles or more. Therefore, it is likely that Zarembo Island is only large enough to support two wolf packs.

Roads increase the risk to wolves due to the high level of hunting, trapping, and poaching that occurs along roads. Based on harvest statistics from 1990 to 1995 in ADF&G's Game Management Units (GMUs) 2 and 3, and tabulated by Wildlife Analysis Area (WAA), wolves experienced significantly higher mortality from hunting and trapping in WAAs with higher road densities (Person et al., 1996). Nine wolves were harvested on the Zarembo Island WAA from 1987 through 1996 (Paul, 1998; Muecci, 1998). To reduce the risk from road-related harvest, the 1999 Forest Plan ROD set an open road density threshold (per WAA) of no more than 0.7 mile of open road per square mile for wolves. The open road density for the Zarembo Island WAA is approximately 0.58 mile per square mile (see Issue 2 for a discussion of road use).

Wolves in Southeast Alaska prey on Sitka black-tailed deer, moose, mountain goat, beaver, black bear, spawning salmon, and geese. Deer habitat capability is believed to be the most significant factor affecting the viability of wolf populations (TLMP FEIS, 1997). The Forest Plan Standards and Guidelines recommend that deer habitat capability should be greater than 13 deer per square mile in areas where deer is the principal prey species (TLMP, 1997). Person (1997) recommends using 17 deer per square mile from the deer habitat capability model to ensure meeting the 13 deer per square mile guideline. Current deer habitat capability in the Project Area is estimated to be 24 deer per square mile. Current deer habitat capability on Zarembo Island as a whole is estimated to be 26 deer per square mile (see discussion of Sitka black-tailed deer).

Wolves are considered to be present throughout the Project Area on Zarembo Island, but not abundant (Posner, 1998). Wolf sign was found occasionally during wildlife surveys conducted by Forest Service personnel in 1997 and 1998 (Posner, 1998). A wolf scat was located approximately 0.6 mile east of the end of the existing Road 6594 and a wolf-killed fawn was observed on Road 6590 north of the junction with Road 52021 (northeast of the Project Area). Lone wolves were observed at two locations: (1) along road 6585 in the Snow Pass Old Growth Reserve west of the Project Area; and (2) northeast of the junction of Road 6590 and Road 6597—approximately 2 miles northeast of the Project Area (Posner, 1998).

Effects

Effects on wolves were assessed by comparing current deer habitat capability and road density in the Project Area and on Zarembo Island as a whole against expected conditions after implementation of the action alternatives.

Deer habitat capability in the Project Area would be expected to decline very little under any of the action alternatives. Deer habitat capability in the Project Area under Alternatives 2, 3, and 5 would be roughly 23 deer per square mile, and under Alternative 4, it would be roughly 24 deer per square mile. Thus, deer habitat capability under all of the action alternatives substantially exceeds the 17 deer per square mile recommended by the Forest Plan for wolves.

Open road densities on Zarembo Island would remain under the 0.7 mile per square mile threshold in all alternatives (Table 3-13). Road Management Option B results in lower open road densities than Option A for all of the action alternatives.

Table 3-13
Current Road Densities (mi/mi^2) in the Project Area and in the Zarembo Island WAA and Projected Road Densities Under Each Action Alternative

Area	Area (sq. mi.)	Existing Road (mi)	Current Density (mi/mi^2)	Open Road Density Alt 2[1/] A[2/]	Open Road Density Alt 2[1/] B[2/]	Open Road Density Alt 3[1/] A[2/]	Open Road Density Alt 3[1/] B[2/]	Open Road Density Alt. 4[1/] A[2/]	Open Road Density Alt. 4[1/] B[2/]	Open Road Density Alt 5[1/] A[2/]	Open Road Density Alt 5[1/] B[2/]
Project Area	40.2	7.8	0.19	0.46	0.32	0.51	0.38	0.32	0.32	0.48	0.38
WAA	183.8	107.4	0.58	0.64	0.61	0.65	0.62	0.61	0.61	0.64	0.62

1/ Open road density differs from the road density numbers used in Table 2-5 and Table 3-20 because some closed roads may be accessed by ATVs.

2/ A = Road Management Option A; B = Road Management Option B

Management Indicator Species

MIS are species whose response to land management activities can be used to predict the likely response of other species with similar habitat requirements. In the Forest Plan, 13 MIS have been identified (TLMP FEIS, 1997), 10 of which occur within the Project Area (Table 3-12). The Alexander Archipelago wolf is also a former USFWS Species of Concern and was discussed under Species of Interest; the remaining nine are discussed below.

Sitka Black-tailed Deer (Odocoileus hemionus stikensis)

Sitka black-tailed deer are indigenous to the coastal regions of Southeast Alaska and northwestern British Columbia. Deer are strong swimmers and have occupied almost all islands of the Alexander Archipelago capable of supporting

them, including Zarembo Island. Deer are generalist species and range through all the major habitats on the Island. The Forest Plan protects deer habitat through its system of old growth reserves and through Standards and Guidelines for Matrix areas (TLMP FEIS, 1997).

Sitka black-tailed deer represent species that use lower elevation forest habitats during winter. Low-elevation old-growth forests provide a measure of protection during deep snow conditions. The quality and quantity of winter habitat is assumed to be the most limiting factor for Sitka black-tailed deer in Southeast Alaska (TLMP FEIS, 1997). Winter snow conditions adversely affect deer populations. Deep snow can bury forage, especially in large, open areas, including clearcuts. Also, deer need to use more energy to move through deep snow to find food and cover, which makes them more vulnerable to wolf predation (Mech 1970).

The highest quality winter range exists in high-volume old-growth stands on south-facing slopes below 800 feet (TLMP FEIS, 1997) in areas where maritime influences (warm south winds) are the strongest (the snow-level variable in the deer model). During periods of snow accumulation, old-growth forest provides "optimal thermal cover" (TLMP FEIS, 1997). The combination of a dense canopy with scattered openings allows forage growth in the openings while the canopy modifies snowfall sufficiently to limit snow accumulations. Early-successional stands, especially those in low-elevation areas, provide forage for deer during mild winters and during the remaining seasons.

The deer habitat capability index (HCI) model (updated in 1997) was run to quantify the amount and value of deer winter habitat that currently exists in the Project Area. Variables in the deer model include: forest volume (high-, medium-, low-volume strata old-growth forest and other), post-harvest types, snow accumulation, elevation and aspect, and presence/absence of predators (e.g., wolves). The model assigns optimal values to higher volume strata old-growth forest stands on south-facing slopes at lower elevations in watersheds with low propensity for deep snow. The model assumes that forage is produced for the first 25 years after clearcut harvest but that little forage is produce after 25 years. Areas clearcut within the last 25 years receive low scores in high snow areas but higher scores in low elevation/low snow areas. This is why some past harvest areas within the beach fringe have high habitat values and others do not. However, they do not provide the same range of high-value conditions that the old growth forest provided. Group selection units (removing 10 percent of a 100-acre stand) provide moderate habitat conditions for deer.

The HCI model results are presented in Table 3-11 and displayed in Figure 3-6. Deer winter habitat value in the Project Area varies from HCI scores of 0.10 or less to 0.90 or more. Approximately 1,403 acres (5.5 percent of the Project Area) are high-value habitat, approximately 3,478 acres (13.5 percent) are medium-value habitat, and approximately 20,858 acres are low-value deer habitat. Most of the high-value habitat occurs near the coast at the south end of the Project Area.

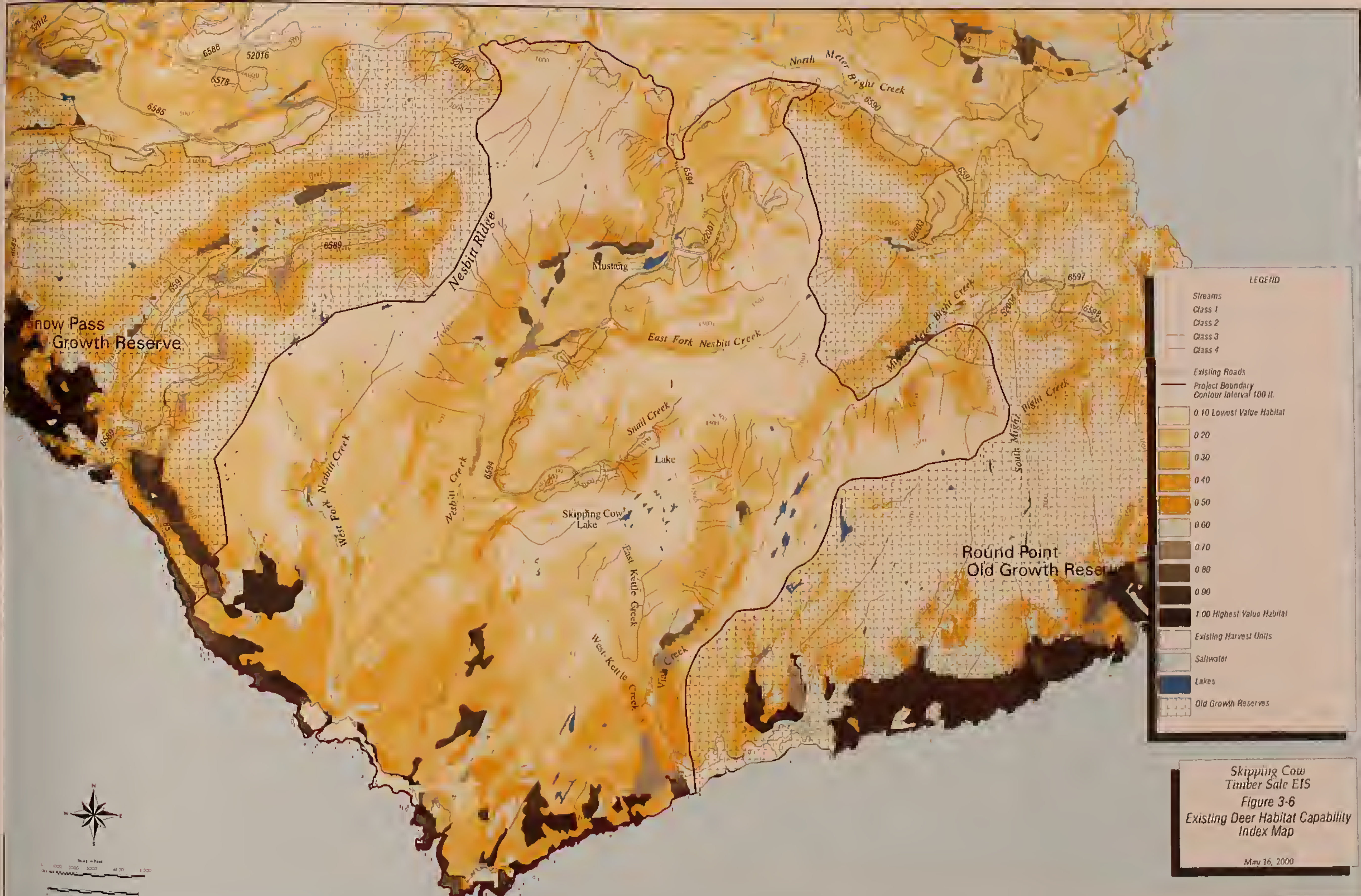
Current proportions of high-, medium-, and low-value deer habitat on Zarembo Island as a whole (WAA 1905 in GMU 3) are similar to proportions within the Project Area. Approximately 6 percent of Zarembo Island (7,008 acres) is currently high-value deer habitat, 14.3 percent (16,879 acres) is medium-value deer habitat, and almost 80 percent (93,724 acres) is low-value deer habitat.

Current deer habitat capability for the Project Area and Zarembo Island as a whole was calculated by multiplying the acreages of low-, medium-, and high-value deer winter range by a maximum long-term deer carrying capacity for each habitat category. The result is not an actual population number but a theoretical long-term carrying capacity given normal winter conditions. The number is useful for purposes of comparison only, and is not intended to estimate actual deer abundance. The current estimated deer habitat capability for the Project Area is 980 deer or 24 deer per square mile, and for Zarembo Island as a whole is 4,860 deer or 26 deer per square mile.

Important deer winter habitat on Zarembo Island is protected within the beach fringe zone and four old growth reserves (two small reserves and two medium reserves). The two small reserves, a 2,430-acre reserve in VCU 456 (Baht Harbor) and a 5,030-acre reserve in VCUs 457 and 458 (St. John), are in the northern one-half of Zarembo Island. The two medium reserves are in the southern one-half of Zarembo Island and border the Project Area on the west and east. To the west is a 14,450-acre reserve in VCU 458 (Snow Pass) and to the east is a 15,250-acre reserve in VCU 459 (Round Point). These reserves have two of the largest remaining blocks of interior old-growth forest on Zarembo Island.

Sitka black-tailed deer is the most important and most harvested terrestrial wildlife species for subsistence purposes and for sport hunting (TLMP FEIS, 1997). Biologists estimate that 10 percent of a population can be harvested at carrying capacity with the population remaining stable and hunter satisfaction remaining high (Suring et al., 1992). Harvest data are collected by the ADF&G and are summarized by WAA. The total harvest for WAA 1905 (Zarembo Island) for 1987 through 1996 was 1,207 deer (ADF&G Southeast Alaska Deer Hunter Survey 1987-1996 cited in the Subsistence Resource Report). An additional 407 deer were harvested in 1997 (USDA Forest Service, 1998d).

Deer harvest on Zarembo Island has increased dramatically since 1991 (ADF&G Southeast Alaska Deer Hunter Survey 1987-1997 cited in the Subsistence Resource Report). Harvest in 1991 was approximately double that in 1990 (117 versus 54) while harvest in 1995 was also approximately double that in the previous year (308 versus 163). This increased harvest is likely to be due to increased hunting pressure, potentially brought about by several factors. These include: increased bag limits, decreased hunting success on other islands, changing perceptions of Zarembo Island as a good place to hunt, and an increasing deer population on Zarembo Island. In 1988, bag limits in GMU 3 south of Sumner Strait were increased to two bucks, and in 1991 Mitkof Island was opened to hunting for the first time in a number of years (personal



Skipping Cow
Timber Sale EIS
Figure 3-6
Existing Deer Habitat Capability
Index Map

May 16, 2000

skippingcow/aml/sps-fig11x17.aml - May 16, 2000 deer.ps

communication, E. Crain, ADF&G, 1998). As a result, Petersburg and Wrangell hunters increased their hunting in GMU 3. At the same time, hunting success on Woronkofski Island, formerly a major deer harvest location for Wrangell hunters, was declining. This was likely due to declining deer numbers.

Wrangell hunters seem to have targeted Zarembo Island as a replacement for Woronkofski because of the close proximity of Zarembo Island to Wrangell.

The increase in harvest on Zarembo Island in 1995 over 1994 was part of a pattern experienced on all other islands in GMU 3 except Etolin Island. Such an increase suggests that regional deer populations were relatively high in 1995. However, while harvest on all other islands except Etolin was lower in 1996 and 1997, harvest on Zarembo Island remained high in 1996 and increased in 1997. Data in the Subsistence Resource Report indicate that Zarembo Island has remained the location of choice for Wrangell hunters, and has increased in popularity among Petersburg hunters since 1995.

Effects

Effects on Sitka black-tailed deer were assessed by comparing current acreage of low-, medium-, and high-value deer winter habitat in the Project Area (as calculated by the deer HCI model) with the predicted acreage of these habitat categories after implementation of each action alternative. In addition, effects on deer were assessed by comparing the estimated deer winter habitat capability (i.e., deer carrying capacity) of the Project Area under current conditions with the estimated deer winter habitat capability after implementation of each action alternative.

Most harvest units are rated as low- to medium-value deer winter habitat due to high elevation, primarily east- or west-facing aspect, and/or high snow levels. Only three harvest units would have a large component of high-value deer habitat: Units 5, 6, and 7. Approximately 90 percent of the trees over 9 inches DBH would be harvested in Units 5 and 6 in Alternatives 3 and 5. Approximately 70 to 80 percent of the trees over 9 inches DBH would be harvested in Units 5 and 6 in Alternative 2 while approximately 25 percent of the trees over 9 inches DBH would be harvested in Units 5, 6, and 7 in Alternative 4. Harvest would lower their value as winter range, especially under Alternatives 2, 3, and 5. High-elevation areas within the Project Area have very low value as deer winter habitat. Currently, the deer population in the Project Area and on Zarembo Island, appears to be above carrying capacity. Even under the No Action alternative, the lack of high-value winter range means that the perceived currently high deer population may be unsustainable if a hard winter, or a series of hard winters, occurs.

High-value deer winter habitat would decrease slightly in all action alternatives, ranging from 46 acres (3.3 percent) in Alternative 4 to 28 acres (2.0 percent) in Alternative 5 (Table 3-11). Medium-value deer winter habitat would decrease slightly in all action alternatives, ranging from 162 acres (4.7 percent) in

Alternative 2 to 97 acres (2.8 percent) in Alternative 4. Low-value deer winter habitat in the Project Area would increase slightly in all action alternatives, ranging from 0.9 percent in Alternatives 2 and 3 to 0.7 percent in Alternative 4. There would be little difference among alternatives in the percentage increase in low-value habitat, or the percentage decrease in medium- and high-value habitat. Thus, there would be little difference among alternatives in the detrimental effect that a harsh winter might have on the deer population in the Project Area.

Current proportions of low-, medium-, and high-value deer winter habitat on Zarembo Island as a whole (WAA 1905 in GMU 3) are virtually the same as within the Project Area. Implementation of any of the action alternatives would be expected to decrease high- and medium-value deer habitat on the Island as a whole by less than one percent.

The current estimated deer winter habitat capability (i.e., deer carrying capacity) for the Project Area is 980 deer, which translates to a density of 24 deer per square mile for the 25,720-acre Project Area. The estimated deer habitat capability for Alternatives 2 and 3 would be 945 deer (23 deer per square mile), for Alternative 4 it would be 1,000 deer (24 deer per square mile), and for Alternative 5 it would be 950 deer (23 deer per square mile). Although these are very rough capability estimates, it is apparent that deer habitat capability and deer density would be expected to decrease only slightly (less than four percent) in all action alternatives. In addition, there would be little measurable difference among alternatives in the percentage decrease.

The current estimated deer winter habitat capability (i.e., deer carrying capacity) for Zarembo Island as a whole is 4,867 deer, which translates to a density of 26 deer per square mile for the 117,611-acre island. This is a considerably higher density than the 19 deer per square mile reported for Zarembo Island in the Forest Plan (see Table 3-112 of TLMP FEIS, 1997). This difference is likely due to the scale at which the model was run (i.e., the Forest Plan modeling effort and the modeling effort for this EIS). Because deer winter habitat capability in the Project Area would decrease by less than four percent in any of the action alternatives, deer habitat capability on Zarembo Island as a whole would be expected to decrease even less.

The actual deer population of Zarembo Island is unknown. A common perception among hunters and other people working on Zarembo Island is that the island's deer population has been increasing in recent years (Elze and Posner, 1997; USDA Forest Service, 1998d; and personal communication, E. Crain, ADF&G, 1998). Deer pellet-group counts in 1994 and 1997 show an increasing trend between these years (Elze and Posner, 1997). However, the limited data available and the potential for variability would make support for this preception tentative. Favorable forage conditions, especially in previously-harvested areas, and a series of mild winters may have contributed to a potential population growth. Clearcut harvest units within the Project Area would be expected to increase available forage but to decrease winter cover during the first 25 to 30 years after harvest under any of the action alternatives. The selective harvest to

be used in the Nesbitt Creek units in Alternative 4 would likely increase forage availability while causing a smaller decrease in winter cover than clearcuts. After 25 to 30 years, deer habitat capability would be expected to decrease as more stands enter the "stem-exclusion" phase, when canopy closure shades out understory vegetation and deer forage declines precipitously and habitat value decreases (forest stand dynamics are discussed under Issue 5). This could be offset by thinning and/or by creating small openings to speed development of the structural conditions found in old growth stands. Future timber harvests would create additional forage areas but might, depending of unit placement, further reduce high-value winter range.

The Forest Plan states that deer habitat capability on Zarembo Island as a whole is expected to decrease by about 18.5 percent between 1995 and 2095 as a result of natural plant succession within existing clearcuts and programmed timber harvest (see Table 3-110 of TLMP FEIS, 1997 for a list of assumptions used in calculating this figure). Applying this percentage decline to the current estimated deer habitat capability for Zarembo Island (26 deer per square mile) results in an expected decrease of roughly 5 deer per square mile by 2095 (to about 21 deer per square mile).

Biologists estimate that 10 percent of a population can be harvested at carrying capacity with the population remaining stable and hunter satisfaction remaining high (Suring et al., 1992). Reported deer harvest on Zarembo Island has averaged 341 deer annually for the past three years (1995 through 1997). The level of illegal deer harvest is unknown. Therefore, the total percentage of the deer population harvested may be substantially higher. An annual harvest of 341 deer represents seven percent of the current estimated deer habitat capability of 4,860 deer for Zarembo Island as a whole. Using maximum deer population numbers is outside the intended use of the deer model but was used this way as a measure of gross comparison. Thus, such high harvests appear to be sustainable for at least another 10 to 20 years (while forage production is good), barring the occurrence of a hard winter. However, the deer population in the project Area and on Zarembo Island, appears to be above carrying capacity. If a harsh winter does occur, the deer population could suffer heavy mortality because of the lack of low-elevation, high-volume stratum old growth in the Project Area, and on Zarembo Island as a whole. This scenario would likely occur no matter which of the alternatives is implemented, including the No Action Alternative.

Maintaining wildlife corridors between the Snow Pass Old Growth Reserve and the Round Point Old Growth Reserve would maintain the effectiveness of these areas as deer reserves by fostering population interchange between the areas, and providing additional predator escape/avoidance options for deer. All alternatives would maintain wildlife corridors between the reserves in the form of the beach fringe zone and riparian corridors through the middle Nesbitt Creek area east to the Round Point Old Growth Reserve (Figures 3-2 to 3-5). In addition, the reserves would remain broadly connected with one another in the low-elevation, gently-sloping southern portion of the Project Area under all of the alternatives.

River Otter (*Lutra canadensis*)

River otters are associated with coastal and fresh water aquatic environments and the immediately adjacent upland habitats (within 100 to 500 feet) (TLMP FEIS, 1997). Beach characteristics affect the availability of food, and adjacent upland vegetation is also important in providing cover for otters. Old-growth forests have the highest habitat value, providing canopy cover, large-diameter trees and snags, and burrow and den sites. Younger successional stages provide lower quality habitat. River otters are known to occur on Zarembo Island (Paul, 1998).

Effects

River otters are protected by Forest Plan Standards and Guidelines that protect old growth habitat, riparian habitat, and the beach fringe (TLMP, 1997). The action alternatives have been designed to minimize adverse effects on streams and riparian habitats. Specifically, harvest units have been laid out to avoid the principal riparian habitats, and mitigation measures (e.g., stream buffers) have been included in unit cards to reduce harvest effects on streams and riparian areas within or adjacent to harvest units. Localized and temporary disturbance would be anticipated under all action alternatives as a result of road construction and timber harvest. However, no substantive adverse effects to the river otter are anticipated under any of the action alternatives.

Black Bear (*Ursus americanus*)

Black bears are present throughout the mainland and on the islands south of Frederick Sound (TLMP FEIS, 1997). They use habitats from sea level to alpine. Suring et al. (1993) reports that high, medium, and low volume old growth, clearcuts, muskeg forest, and sub alpine avalance slopes all have relatively high habitat index values for black bear. Estuarine, riparian, and forested coastal habitats receive the highest use by black bears and appear to have the highest habitat values (TLMP FEIS, 1997). Within forested areas, both early and late (old-growth) successional stages provide good forage and/or cover for black bears (TLMP FEIS, 1997). Black bears, especially females with cubs, often will not forage far from forest cover (Herrero, 1978; Suring et al, 1993). Harvest prescriptions that leave islands or that only remove a portion of the trees may provide cover and increase the use of harvest units by bear.

Black bear sightings fluctuate from year to year on Zarembo Island. Most sightings known to Forest Service biologists have been made in the St. John Creek drainage north of the Project Area (Posner, 1998). Snow Pass Creek supports a large anadromous salmon run along a short stretch, and this may be an important food source for bears. Black bears prefer streams with anadromous fish to streams with resident fish populations (TLMP FEIS, 1997).

The black bear HCI model was run to quantify the amount and value of black bear habitat in the Project Area and on Zarembo Island as a whole. Model

results are presented in Table 3-11 and displayed in Figure 3-7. Within the Project Area, approximately 649 acres (2.5 percent) are low-value habitat approximately 18,912 acres (73.5 percent) are medium-value habitat, and approximately 6,179 acres (24.0 percent) are high-value habitat. On Zarembo Island as a whole, approximately 2,681 acres are low-value black bear habitat (2.3 percent), approximately 105,263 acres are medium-value habitat (89.4), and approximately 9,746 acres are high-value habitat (8.3 percent).

Effects

Black bear habitat is protected within the old growth reserves and by Forest Plan Standards and Guidelines that protect old growth habitat, riparian habitat, and the beach fringe (TLMP FEIS, 1997). Under Option A, high-value black bear habitat in the Project Area would decrease under all of the action alternatives. Approximately 4,104 acres of high-value habitat would be converted to medium-value habitat under Alternatives 2 and 3, approximately 3,775 acres would be converted under Alternative 4, and approximately 4,069 acres would be converted under Alternative 5. Most of this change is due to the additional roads which would remain open under Option A. Under Option B, approximately 2,842 fewer acres of high-value habitat would be converted to medium-value habitat under Alternatives 2 and 3, approximately 3,511 fewer acres under Alternative 4, and approximately 3,033 fewer acres under Alternative 5 (see Table 3-11).

Vancouver Canada Goose and Sandhill Crane

The Vancouver Canada goose (*Branta canadensis fulva*) is distributed throughout Southeast Alaska (TLMP FEIS, 1997). The Vancouver Canada goose uses forested and nonforested wetlands in estuary, riparian, and upland areas of the forest (TLMP FEIS, 1997). During wildlife surveys in 1997, Forest Service personnel noted abundant goose signs at Mustang Lake and around a number of muskeg ponds (Posner, 1998). Two adults together with five goslings were observed in a muskeg pond on the ridge separating the Nesbitt Creek drainage from the Snow Pass Creek drainage, approximately 1 mile northwest of Unit 10.

Sandhill cranes (*Grus canadensis*) were observed at several locations during wildlife surveys in 1997 (Posner, 1998), including the Nesbitt Creek drainage approximately 0.5 mile southwest of Mustang Lake, in the Mustang Creek drainage approximately 0.5 mile north of Mustang Lake, and on a muskeg pond northeast of the end of Road 6594.

Effects

No substantive adverse effects to wetland nesting habitat for Vancouver Canada geese and sandhill cranes are likely under any of the alternatives. Localized and

temporary disturbance to sandhill crane and goose nesting or brood-rearing habitat on the ridge north and west of Nesbitt Creek around Mustang lake, and on the ridge between Nesbitt Creek and Vial Creek would be anticipated under all action alternatives as a result of road construction or timber harvest (especially helicopter logging). Forest Plan Standards and Guidelines (TLMP, 1997) require human disturbance of important nesting and brood-rearing, molting, and winter habitat to be minimized. Avoiding timber harvest in Units 5 and 7 between April 1 to June 15 would mitigate disturbance effects. Avoiding road construction within 300 feet of nesting and brooding habitat (based on input from the USFWS) would also mitigate disturbance effects. These restrictions have been included in the mitigation measures for Units 5 and 7.

Eagles

The bald eagle (*Haliaeetus leucocephalus*) is a MIS on the Tongass National Forest. The USFWS and Forest Service maintain an interagency agreement for bald eagle habitat management in the Alaska Region. All identified nest trees are surrounded by a 330-foot radius protective management zone. Helicopter activities for this timber sale would be restricted within 0.25 mile of active eagle nests. Eleven bald eagle nest sites have been documented along the shoreline of Zarembo Island within the Project Area (Figure 3-1). Additional bald eagle nest sites are known to occur along the shoreline within the Old Growth Reserves east and west of the Project Area.

Effects

No eagle nests have been located in the vicinity of any of the harvest units. Therefore, no adverse effects on eagles are expected.

Old-Growth Forest MIS

There are three songbird MIS for old-growth forests on Zarembo Island (TLMP FEIS, 1997). These are red-breasted sapsucker (*Sphyrapicus ruber*), hairy woodpecker (*Picoides villosus*), and brown creeper (*Certhia americana*). The red squirrel (*Tamiasciurus hudsonicus*) is also considered an old-growth MIS.

All three songbird species were documented during bird surveys conducted in the vicinity of the Project Area (Snow Pass Road, Middle Road, and Beach Road point counts) from 1995 through 1997 (Posner, 1998). In addition, Forest Service biologists documented at least 30 other songbird species during those bird surveys. Red squirrels were captured during small mammal trapping in the Project Area in 1997 (USDA Forest Service, 1997b).

The red-breasted sapsucker is found throughout Southeast Alaska during the spring, summer, and early fall seasons, wintering in the coastal portion of its breeding range as far north as Prince of Wales Island. Red-breasted sapsuckers

Skipping Cow
Timber Sale EIS
Figure 3-7
Existing Black Bear Habitat
Capability Index Map

May 16, 2000

skippingcow/amlsips-fig11x17.aml - May 16, 2000 bear.ps

use old-growth forest habitats with snags. The quantity of snags has a direct relationship to the number of red-breasted sapsuckers within an area. Old-growth forests provide the best snag habitat over the long term, with the low volume old-growth classes receiving more use than high volume classes (TLMP FEIS, 1997). Optimum habitat use is believed to occur when patches of preferred habitat are greater than 250 acres. Use declines to zero when patches are less than 5 acres (TLMP FEIS, 1997).

The hairy woodpecker is considered an uncommon, permanent resident throughout Southeast Alaska. Hairy woodpeckers use old-growth forest habitats with snags and partially dead trees for foraging and nesting. Winter habitat may be a limiting factor for hairy woodpeckers (TLMP FEIS, 1997). Snag quantity has a direct relationship to the potential use of an area by hairy woodpeckers. Old-growth forests provide the best long-term snag habitat, with high volume old-growth stands receiving more use than low volume stands. Optimum habitat use is believed to occur when patches of preferred habitat are greater than 500 acres. Use declines to zero when patches are less than 5 acres (TLMP FEIS, 1997).

The brown creeper is considered an uncommon, permanent resident throughout Southeast Alaska. This species is associated with large old-growth trees found in high volume old-growth forests. Winter habitat has been suggested as the principal limiting factor for the brown creeper (TLMP FEIS, 1997). Optimum habitat use is believed to occur when patches of preferred habitat are greater than 15 acres. Use declines to zero when patches are less than 1 acres (TLMP FEIS, 1997).

Red squirrels require forests with cone-producing trees and cavities in trees and snags. Spruce trees and mature to old-growth forests are considered to have the highest values for red squirrel habitat (TLMP FEIS, 1997). Optimum habitat is believed to occur where patches of preferred habitat are greater than 30 acres (TLMP FEIS, 1997).

Effects

All of the action alternatives would have adverse effects on the four old-growth forest MIS species by removing old-growth forest habitat and increasing the fragmentation of remaining old-growth forest habitat (Table 3-11). Alternative 5 would remove the least amount of old-growth forest habitat.

Of these species, brown creepers would be least affected by removal and fragmentation of old-growth forests, because they require the smallest patch size (15 acres) for optimum habitat use (TLMP FEIS, 1997) and because they are likely to continue to use snags and leave trees within the harvest units. In contrast, the red-breasted sapsucker prefers patches of 250 acres for optimum habitat use, and the hairy woodpecker prefers patches of 500 acres for optimum habitat use, though both will use smaller patches. The hairy woodpecker and the red-breasted sapsucker are less likely to use snags and leave trees within the

harvest units in the short term. In the long term, research in other areas shows that second growth stands with remnant large trees and snags provide usable habitat much sooner than single-aged stands (FEMAT, 1993). Harvest prescriptions that retain more large trees in harvest units provide better structure for wildlife than prescriptions which leave less trees, such as clearcutting. Two-aged and uneven aged systems contribute more to the richness of the forest mosaic than the even-aged system (clearcutting). This richness is an important component of biodiversity. Alternatives 3 and 5 provide some structure by leaving reserve trees. Under Alternative 2, all units would be managed as two-aged stands, providing a higher level of snags and remnant trees than Alternatives 3 and 5. Alternative 4 would manage most of the Nesbitt area as an uneven-aged stand, providing the highest level of snags and trees of the action alternatives. Alternative 4 would manage most of the remaining units the same as under Alternatives 3 and 5. Most of Units 12 to 17 would be managed the same as under Alternative 2. Red squirrels, which prefer patches of 30 acres, would be affected less than red-breasted sapsuckers or hairy woodpeckers. Currently, the Project Area has six patches of medium/high-volume old-growth forest greater than 250 acres. Six patches greater than 250 acres would remain in the Project Area under all of the action alternatives. At present, the Project Area has two patches greater than 500 acres and one patch of 489 acres. Under Alternatives 2, 3, and 5, one patch greater than 500 acres and one patch of 493 acres would remain in the Project Area. Under Alternative 4, only one patch greater than 500 acres would remain. However, since only 25 percent of the trees over 9 inches DBH would be removed, the harvested areas are likely to continue to provide habitat for old-growth species.

Sensitive Species

The Queen Charlotte goshawk, trumpeter swan, and osprey are Forest Service sensitive species. The Queen Charlotte goshawk is also a species of concern and is discussed under that section. The trumpeter swan and the osprey are discussed below.

Trumpeter Swan

The trumpeter swan (*Cygnus buccinator*) is a Forest Service sensitive species on the Tongass National Forest. Trumpeter swans have been observed in St. John Harbor, approximately 6 miles northwest of the Project Area (Posner, 1996).

Osprey

The osprey (*Pandion haliaetus*) is a Forest Service sensitive species. Forest Plan Standards and Guidelines require that all nest trees be surrounded by a minimum 330-foot-radius habitat management zone. No osprey nests have been found in the Project Area. An osprey nest has been documented in the Meter Bight drainage northeast of the Project Area (Hughes, 1981).

Effects

No adverse effects on trumpeter swans or osprey are expected from any of the alternatives (Project BE, 1999).

Other Important Species

Elk (Cervus canadensis)

Elk have only recently colonized Zarembo Island. At present, their numbers appear to be low, but growing. Limited elk sign (tracks, pellets, and wallows) was found in various parts of the Project Area during wildlife surveys in 1997 (Posner, 1998). Surveys identified the southeast corner of the Project Area, on north- and west-facing slopes just east of the junction of Kettle Creek and Vial Creek, as the area with the heaviest elk use. This area appears to be an important wintering area for elk. The second largest amount of elk sign was encountered on a southeast-facing slope at the upper end of Middle Meter Bight drainage. Both these areas are currently unroaded. Roads increase hunting and poaching pressure on elk, resulting in higher mortality.

The Forest Service contracted ADF&G to fly elk surveys over Zarembo Island and estimate the elk population of the island. Six elk tracks were observed on one flight and three elk were seen on another flight in the Snow Pass area. The elk population of the island has been estimated at 40 individuals by ADF&G, although this is a very rough estimate (Posner, 1998).

Effects

All of the action alternatives have been designed to avoid an important elk wintering area near the junction of Kettle Creek and Vial Creek in the middle of the Vial Creek drainage. Another elk use area, a southeast-facing slope at the upper end of the Middle Meter Bight drainage, would be harvested (Unit 18) in all of the action alternatives. Elk use would likely increase for a number of years (15 to 20 years), while good forage was present on the site, then decline again as the developing forest entered the "stem-exclusion" phase. This could be offset by thinning and/or by creating small openings to increase forage production. If the road into this area remains open, improved human access may result in elk mortality from hunting and/or poaching. If the new roads into the Middle Meter Bight Creek and Vial Creek areas are closed, human disturbance would be reduced but would still increase compared to current levels.

Other Raptors

The Forest Plan calls for a 600-foot windfirm buffer around active raptor nests. A sharp-shinned hawk (*Accipiter striatus*) nest was located during wildlife surveys in the Project Area in 1997 (Posner, 1998). The nest was on an east-

facing slope at an elevation of approximately 860 feet in the upper Vial Creek drainage. Surveys of the known nest site are necessary to determine nest activity prior to project implementation. Red-tailed hawks (*Buteo jamaicensis*) were observed at the north and south ends of the large old-growth forest block west of Mustang Lake in 1997 (Posner, 1998). Although no nest was located, the behavior of the birds indicated that they were probably nesting in the area (Posner, 1998). A merlin (*Falco columbarius*) nest was previously documented in the southwest corner of the Project Area, approximately 2 miles from any harvest units (undated Forest Service map titled "Wildlife Habitat, Nesbitt Reef T.S.").

Effects

Forest Plan Standards and Guidelines call for a 600-foot windfirm buffer around active raptor nests (TLMP, 1997). The only known raptor nest site in the Project Area is a sharp-shinned hawk nest in the Vial Creek drainage. All of the action alternatives have been designed to meet the 600-foot buffer standard around this nest site. Therefore, no significant adverse effects to nesting raptors are anticipated under any of the action alternatives.

Olive-sided Flycatcher (Contopus borealis)

The olive-sided flycatcher is fairly common in open coniferous forests and forest edges (Armstrong, 1995). This species is expected to frequent riparian areas in the Project Area, including the edges of lakes and muskegs. Forest Service biologists documented olive-sided flycatchers during bird surveys (Posner, 1998).

Effects

The action alternatives have been designed to minimize adverse effects on riparian habitats. Specifically, harvest units have been laid out to avoid the principal riparian habitats, and mitigation measures (e.g., stream buffers) have been included to reduce harvest effects on streams and riparian areas within or adjacent to harvest units. In addition, all alternatives would create additional forest edge habitats utilized by olive-sided flycatchers. Therefore, no substantive adverse effects to the olive-sided flycatcher are anticipated under any of the action alternatives.

Access Issues

Road access is a key issue for the Skipping Cow Timber Sale (Issue 2). Roads are an important wildlife-related issue for several reasons. Roads in forested areas can cause habitat fragmentation, allowing edge species new access to forested areas and creating dispersal barriers for some species. Roads, especially

heavily-used roads, can be a disturbance factor to some sensitive wildlife species such as wolves and elk. Roads can also create access to the forest for legal as well as illegal wildlife harvest for human hunters, thus increasing total harvest pressure.

At present, the Project Area has one main road (Road 6594) and two spur roads off the main road (Roads 52007 and 52008). A small portion of Road 52004 extends into the northeast corner of the Project Area. This road is scheduled to be decommissioned in 1999. There are approximately 7.8 miles of system roads within the Project Area.

Effects

Roads in forested areas can cause habitat fragmentation, thereby allowing edge species new access to forested areas. Roads can create physical barriers to movement for certain low-mobility wildlife species. Heavily-used roads can be a disturbance factor to some sensitive wildlife species such as nesting marbled murrelets or northern goshawks, denning wolves, and elk. New roads can open the newly-roaded areas to additional hunting and/or trapping pressure.

Alternative 1 would build no new roads and would have no adverse effects on wildlife. Of the active alternatives, Alternative 4 would build the least road and would have the least impact on wildlife. Alternative 3 would build the most road and would have the greatest effect on wildlife. Alternative 5, which builds less road in the Nesbitt area, and Alternative 2, which does not build Road 52034 into the Middle Meter Bight drainage, would have less adverse impacts on wildlife than Alternative 3 but more than Alternative 4.

Within each action alternative there are two road management options. Under Road Management Option A, all roads would be left open and would be maintained as needed. Under Road Management Option B, the new roads would be closed and placed in storage. In general, within each action alternative, Road Management Option B would be better for wildlife than Option A because it would limit hunter/trapper access and would lower disturbance levels caused by vehicle passage on roads.

Cumulative Effects

Cumulative effects are the result of accumulated land management activities. Assessed individually, these activities may have only a minor effect, but the multiple actions assessed collectively through time may result in greater ecological disturbance.

The Skipping Cow project was designed to be fully consistent with the Forest Plan (TLMP, 1997; TLMP FEIS, 1997; and TLMP ROD, 1999). Looking beyond the project and projecting cumulative effects is best done by tiering to

the Forest Plan ROD and the Final EIS and by incorporating by reference Appendix N of the Forest Plan.

Specifically, the most pertinent are the Old-growth Forest Conservation Strategy, which begins on page 3-382 of the Forest Plan Final EIS; the MIS section, which begins on page 3-363; and the Sitka black-tailed deer, on page 3-365. Tables 3-110 through 3-112 in the Deer section include projections to the year 2095 for habitat capability, protected winter range, and densities by WAA. Note that Alternative 11 in the tables is the Forest Plan selected alternative (with modifications). Appendix N provides additional evaluation of wildlife habitat conservation measures. Specifically, the old-growth habitat strategy, goshawk, wolf, and other terrestrial mammals are most pertinent.

The task of maintaining habitats to support viable populations has been approached through several strategies. The Forest Plan addresses the issues of biodiversity and population viability on the Forest-wide level. These strategies have been incorporated into the Skipping Cow alternatives.

Cumulative effects on principal habitats and species of concern were assessed by comparing historical conditions (number and size of patches, etc.) in the Project Area with the predicted condition after implementation of each action alternative. For GIS modeling and analysis purposes, previously-harvested stands were assumed to be medium-volume old-growth prior to harvest. In addition, reasonably foreseeable future actions (including road decommissioning and timber harvest) are discussed.

Old-Growth Forest

Approximately 1,141 acres in 23 harvest units (much of which is in the beach fringe, an area that no longer is suitable for timber management under the Forest Plan [TLMP FEIS, 1997]) have been harvested in the Project Area. Assuming that these acres were all medium- or high-volume old-growth prior to harvest, the Project Area had 7,011 acres of medium/high-volume old-growth forest, and 3,509 acres of low-volume old-growth prior to timber harvest (Table 3-11). Currently, 84 percent of the historical medium/high-volume old-growth forest still remains, while 100 percent of the historical low-volume old-growth still remains. Under Alternatives 2 and 3, 69 percent of the historical medium/high-volume old growth, and 98 percent of historical low-volume old-growth would remain. Under Alternative 5, 72 percent of the historical medium/high-volume old growth, and 99 percent of historical low-volume old-growth would remain. Under Alternative 4, 79 percent of the historical medium/high-volume old growth, and 108 percent of historical low-volume old-growth would remain (the increase in low-volume old-growth is a result of the manner in which harvest was modeled for certain units in Alternative 4).

Future timber sales on Zarembo Island are likely to remove additional medium- and high-volume old growth. For example, the 10 MMBF Baht Timber Sale,

planned for the northern part of Zarembo Island in 2002, will likely remove some high- and medium-volume old-growth forest. Future timber sales within the Project Area, likely to occur 20 to 30 years from now, will also likely remove additional high- and medium-volume old growth. Partially offsetting the loss of old-growth habitat would be growth in past harvest units. Some units, especially those in the beach fringe, will be 70 to 80 years old by then. Thinning and/or creating small openings in these stands could speed development of some of the structure found in old-growth stands. Also, a substantial portion of the old growth on the island is protected in the old-growth reserves, the beach fringe, riparian buffers, and other protected areas. These areas, including 2 small old growth reserves and 2 medium old growth reserves, were established by the Forest Plan, in part, to ensure that the cumulative impact of timber management did not threaten the viability of species closely associated with old growth forest. The Forest Plan estimates that 62 percent of the old growth that existed in 1954 will exist in 2095.

Under historical conditions, the Project Area had 42 patches of medium/high-volume old-growth forest. The largest patch was 2,048 acres in size (Table 3-11). Currently, there are 75 patches. The largest patch is 1,576 acres. Under Alternatives 2 and 3, the number of patches would increase by 178 percent and the maximum patch size would decrease by 66 percent from historical conditions. Under Alternative 5, the number of patches would increase by 164 percent, and the maximum patch size would decrease by 52 percent from historical conditions. Under Alternative 4, the number of patches would increase by 93 percent, and the maximum patch size would decrease by 56 percent from historical conditions. Large patches of medium/high-volume old-growth forest will remain in the 14,450-acre Snow Pass Old Growth Reserve on the west boundary of the Project Area and in the 15,250-acre Round Point Old Growth Reserve on the east boundary of the Project Area, as well as in the two small old growth reserves in the north half of the island.

Marbled Murrelet

Under historical conditions, approximately 6,963 acres in the Project Area were high value marbled murrelet nesting habitat (Table 3-11). Currently, 84 percent of the historical high value murrelet habitat remains. Under Alternatives 2 and 3, 68 percent of the historical high value murrelet habitat in the Project Area would remain; under Alternative 5, 72 percent of the historical high value murrelet habitat would remain; and under Alternative 4, 79 percent would remain.

Future timber sales on Zarembo Island are likely to remove additional high value murrelet habitat. For example, the 10 MMBF Baht Timber Sale will likely remove some high- and medium-volume old-growth forest—forest which forms the best habitat for murrelets. Future timber sales within the Project Area, likely to occur 20 to 30 years from now, would also likely remove additional high- and

medium-volume old growth. Habitat for murrelets would continue to be provided in the old growth reserves and in other protected areas.

Queen Charlotte Goshawk

Under historical conditions, approximately 3,070 acres in the Project Area were high value goshawk nesting habitat (Table 3-11). Currently, 75 percent of the historical high value goshawk habitat remains. Under Alternatives 2 and 3, 72 percent of the historical high value goshawk habitat in the Project Area would remain; under Alternative 5, 73 percent would remain; and under Alternative 4, 73 percent would remain.

Future timber sales on Zarembo Island (e.g., the Baht Timber sale estimated at 10 MMBF) are likely to remove additional high value northern goshawk habitat. Future timber sales within the Project Area, likely to occur 20 to 30 years from now, would likely remove additional high- and medium-volume old growth. Habitat for goshawks would continue to be provided in the old growth reserves and in other protected areas.

Sitka Black-tailed Deer

Under historical conditions, approximately 20,856 acres in the Project Area were low-value deer habitat, approximately 3,481 acres were medium-value habitat, and approximately 1,403 acres were high-value habitat (Table 3-11). Most of the low-value and medium-value habitat remains, as does most of the high-value habitat outside of the beach fringe. However, most of the beach fringe habitat—which provided an important travel corridor as well as high-value forage, hiding, and thermal cover—was harvested, some in the 1930s and the rest in the 1970s. The areas harvested less than 25 years ago are rated as high-value habitat by the deer model (Figure 3-6) because they provide forage and remain snow-free for most of the year. However, they do not provide the same range of high-value conditions that the old growth forest provided. Also, unless these are thinned to maintain open conditions, they will soon enter the stem-exclusion stage and will no longer be considered high-value habitat.

Based on the results of the deer model (described on pages 100 to 103), under Alternatives 2 and 3, 98 percent of the original high-value deer habitat in the Project Area would remain, and 95 percent of original medium-value deer habitat would remain. Under Alternative 5, 98 percent of the original high-value deer habitat and 97 percent of the original medium-value deer habitat would remain. Under Alternative 4, 97 percent of the original high-value deer habitat in the Project Area would remain, and 97 percent of original medium-value deer habitat would remain.

These relatively minor changes in percentages of high-, medium-, and low-value deer habitat do not accurately reflect structural changes in the habitat from historical conditions to post-project conditions. Under historical conditions,

much of the high- and medium-value deer habitat was medium/high-volume old-growth forest, whereas under current conditions, much of the high-value deer habitat is regenerating clearcut areas. The value of these areas as deer habitat will decline over the next 25 to 30 years as stands enter the "stem-exclusion" phase. Deer habitat capability would then be expected to decrease unless the stands are thinned, or openings are created to favor forage production.

The Forest Plan states that deer habitat capability on Zarembo Island as a whole is expected to decrease by about 18.5 percent between 1995 and 2095 as a result of programmed timber harvest. Applying this percentage decline to the current estimated deer habitat capability for Zarembo Island (26 deer per square mile) results in an expected decrease of roughly 5 deer per square mile by 2095 (to around 21 deer per square mile). Future timber sales within the Project Area, likely to occur 20 to 30 years from now, would likely remove high- and medium-value deer winter habitat at the same time as much of the current high-value habitat enters the "stem-exclusion" phase. These sales would create new forage areas to at least partially replace those lost through forest maturation but would also reduce optimal thermal cover. As younger stands mature, especially in the beach fringe, new thermal cover will develop.

Recent research by Kirchhoff and Larsen (1998) indicates that clearcut logging creates conditions that may give elk a competitive advantage over deer. They state that elk are better able to negotiate the deep snow that can accumulate in young clearcuts and elk will also be able to better process the relatively coarse forage (conifers and tall shrubs) that predominates in clearcuts. (See comment JC#17 in Appendix G.)

Alexander Archipelago Wolf and Black Bear

Open road density and old-growth forest cover are two important factors to consider in assessing cumulative effects to wolves and black bears. Open road densities are important determinants of hunting pressure on both species, whereas old-growth forest is important as cover to black bears and as habitat for prey species (deer) for wolves. Under historical conditions, the Project Area was essentially unroaded and had at least 6,963 acres of medium-/high-volume old-growth forest. Currently, the Project Area has approximately 8 miles of open road, and 5,822 acres of medium-/high-volume old-growth (84 percent of historical conditions). Under Alternatives 2 and 3, 69 percent of the historical medium/high-volume old-growth in the Project Area would remain, under Alternative 5, 72 percent of the historical medium/high-volume old-growth would remain, and under Alternative 4, 79 percent of the historical medium/high-volume old-growth would remain. The Forest Plan estimates that 62 percent of the old growth that existed in Zarembo Island in 1954 will exist in 2095.

All action alternatives would increase the amount of roads within the Project Area and on Zarembo Island as a whole. Although closing certain roads would result in less use of the area by people than leaving them open, even closed roads

would increase use of the Project Area compared to existing use because the roads would improve foot access. Decommissioning roads in the Round Point Old Growth Reserve, which is planned for 1999, would likely benefit wolves and bears by reducing hunting pressure.

Timber sales on Zarembo Island are likely to remove additional medium- and high-volume old-growth forest and could increase the density of roads. Road closures for this and for future timber sales could mitigate the effects of new road construction.

Issue 4: Subsistence

Introduction

This issue centers around the potential effects, including cumulative effects, of timber harvest and road construction on the abundance and distribution of subsistence resources, and the opportunities for harvest of these resources. Some commenters noted that roads reduce subsistence opportunities; they also make it easier for wolves to cover territory faster, increasing their successful predation of deer. Some commenters, however, want roads left open after logging is completed to increase the ease of access and to facilitate deer harvest. Some expressed concern specifically with the effects of timber harvest on Zarembo Island because of its high subsistence use by the residents of Wrangell and Petersburg. Concerns range from diminished subsistence resources to increased competition for subsistence resources due to the presence of logging roads. Other concerns include competition from resource users residing elsewhere, and access to the resources, as well as changes in the experience of the activity as a focus of cultural identity.

This section primarily addresses those communities with significant documented use of Zarembo Island—these are the nearby communities of Wrangell and Petersburg. Residents of other communities occasionally use this area, but on an irregular basis. A more complete discussion and documentation of this issue can be found in the Subsistence Resource Report (USDA Forest Service, 1998d), which also provides detailed socioeconomic information for Wrangell and Petersburg.

Wrangell and Petersburg

Wrangell is located on the northern tip of Wrangell Island, about 40 miles south of Petersburg and 85 miles north of Ketchikan. It is a dispersed community with a total 1990 population of 2,479. Historical Wrangell is, however, relatively concentrated and development outside of this area is relatively recent.

Wrangell Island has a long history of Native use. Euroamericans were first drawn to the area by furs and then by gold. Wrangell continues to provide transportation and staging services for regional gold mining activities, and trapping continues at a relatively low level. Fishing developed as an economic activity as gold and furs waned as commercial resources, and remains primary today. Timber has also been important, but the closing of the Alaska Pulp Corporation's Wrangell sawmill in 1994 had profound effects on the city's economy as a whole, directly affecting 20 percent of the total 1994 work force. Smaller-scale timber processing continues, but the overall scope of timber operations in Wrangell is still uncertain at this time. The retail and support sectors continue to be important economic sectors. Government has become

increasingly important and the tourism sector has been developing, as it has in the region as a whole. Wrangell is a regional hub, but it has only a limited local road network. There is daily jet service to major cities in the northwest and floatplane service from Wrangell to more remote communities. Wrangell is also served by the Alaska Marine Highway ferry system.

Petersburg is located on the northwest shore of Mitkof Island, which is situated at the north end of Wrangell Narrows, about midway between Ketchikan and Juneau. Petersburg is approximately 40 miles northwest of Wrangell. Facing Petersburg across the narrows on Kupreanof Island is the small village of Kupreanof. Petersburg was incorporated in 1910, with a population of almost 600. The community has experienced almost continuous growth since then and had a total population of 3,207 in 1990.

The Petersburg economy, which is fairly typical of most Southeast Alaskan communities, is primarily a mixture of fishing and logging combined with wholesale and retail trade and the services associated with these sectors. Petersburg has no road connections to other communities, but does have daily air service and is a regular stop on the Alaska Marine Highway ferry system. It is a regional hub with a full array of municipal, retail, and service facilities.

Community Subsistence Activities

There are three hierarchical levels of geographical units for examining wildlife and subsistence issues. The smallest is the VCU (federally defined), which in most cases corresponds in its boundaries to the ADF&G "minor" unit. These units reflect watershed boundaries and ADF&G collects harvest and other statistics in terms of these minor units. Information at this level is available for all species except deer. Information on deer is only available at the WAA level. WAAs, defined by ADF&G, are typically comprised of several VCUs and tend to follow VCU boundaries. WAA 1905 (Zarembo Island) is comprised of four VCUs. Portions of VCUs 457, 458, and 459, which comprise the southern part of the island, are within the Project Area.

This discussion primarily addresses Zarembo Island as a whole, treating it as an ecological unit. Thus, harvest information is provided for both project and non-Project Area VCUs. Most state and federal wildlife management regulations are written in terms of still larger geographical units termed GMUs, which are composed of a number of WAAs. The Project Area is part of GMU 3, and historical patterns of deer harvest by GMU are also discussed.

Deer are the most significant subsistence resource on Zarembo Island, with relatively little documented harvest of other resources (Table 3-14). Almost all deer reported to be harvested from Zarembo Island are taken by residents of Wrangell or Petersburg (Table 3-15). Ketchikan hunters have recently reported taking some deer, and residents of other communities have reported harvesting a few deer from Zarembo Island in a limited number of years. Point Baker, Port

Protection, and Coffman Cove are the three communities that might also be expected to use Zarembo Island because of proximity and subsistence orientation. These three communities are discussed in more detail in the Subsistence Resource Report (USDA Forest Service, 1998d). None of these communities are found to have a documented pattern of use of Zarembo Island. Therefore, only Wrangell and Petersburg are considered in detail in the following discussion.

Table 3-14
Summary Harvest Statistics for Zarembo Island by Reporting Unit for Regulatory Years 1987-1996 1/

VCU	ADF&G Minor	ADF&G GMU	ADF&G WAA	Wolf	Beaver	Otter	Deer 2/
456	0502	3	1905	4 3/			NA
457	0503	3	1905	3 4/	5 5/	4 5/	NA
458	0504	3	1905	2 6/		0	NA
459	0501	3	1905	0		7 7/	NA
			1905	NA		NA	1207 8/

1/ Species with no reported harvest are not listed.
2/ Deer harvest available only by WAA.
3/ All taken in 1994 by Wrangell residents.
4/ All taken in 1989, 2 by Wrangell residents and 1 by a Petersburg resident.
5/ All taken in 1996 by residents of Petersburg.
6/ Both wolves taken by residents of Wrangell, one each in 1995 and 1996.
7/ All otters taken by residents of Petersburg in 1988.
8/ Harvest for 1987-1996 only. Total for 1987-1997 is 1,614.
NA = not available
Sources: Paul, 1998 (ADF&G Division of Wildlife Conservation); Muecci, 1998 (ADF&G, Petersburg); ADF&G Southeast Alaska Deer Hunter Survey (1987-1996).

Table 3-15
Total Deer Harvest in WAA 1905 by Community for Regulatory Years 1987-1997 (11 years)

Community	Reported Deer Harvest	% of Total WAA Deer Harvest
Wrangell	1,283	79
Petersburg	249	15
Ketchikan	41	3
Other Alaska	17	1
Outside Alaska	8	0
Shoal Cove	7	0
Coffman Cove	4	0
Zarembo Camp	3	0
Dolomi	2	0
Total	**1,614**	**99**

Source: ADF&G Southeast Alaska Deer Hunter Survey Summaries (1987-1997)

3 Issue 4: Subsistence

Wrangell residents harvest a variety of subsistence resources. This is documented in most detail through the Tongass Resource Use Cooperative Study (TRUCS) of 1987 (Kruse and Frazier, 1988; Kruse and Muth, 1990). In terms of edible harvest, fish constituted 45 percent of the 1987 total harvest, deer 12 percent, invertebrates 25 percent, mammals other than deer 10 percent, and other resources 8 percent. Of the total Wrangell 1987 subsistence fish harvest, 70 percent was taken by rod and reel, 16 percent by commercial gear, and 14 percent by non-commercial gear. Salmon made up about 41 percent of the 1987 harvest, with 73 percent caught by rod and reel, 4 percent by non-commercial gear, and 23 percent by commercial gear. Non-salmon fish made up about 59 percent of the community's fish harvest, with 68 percent caught by rod and reel, 21 percent by non-commercial gear, and 11 percent by commercial gear. Therefore, fish clearly seem to be an important subsistence resource.

Marine invertebrates are also quite important to Wrangell residents, and follow the same pattern. Non-commercial gear is used to harvest 80 percent of all subsistence marine invertebrates, while 20 percent are taken with commercial gear. Residents predominately use local waters to fish, and use rod and reel as the main harvest method for fish and non-commercial gear for marine invertebrates. Given these patterns, and Forest Plan Standards and Guidelines that address fish concerns and mitigate potential effects of logging activities on fish streams, the following discussion does not address these resources further. Rather, it focuses on deer, the primary subsistence resource of potential concern for Wrangell. The TRUCS land use map produced for Wrangell for deer indicates that residents hunted all of Zarembo Island (ADF&G, 1990a).

For the most part, the same holds true for residents of Petersburg, who also harvest a variety of subsistence resources (Kruse and Frazier, 1988; Smythe, 1988). In terms of edible harvest, fish constituted 45 percent of the 1987 total harvest, deer 22 percent, invertebrates 17 percent, mammals other than deer 9 percent, plants 4 percent, and birds 3 percent (Betts et al., 1994). Of the total Petersburg 1987 subsistence fish harvest, 83 percent was taken by rod and reel, 12 percent by commercial gear, and 5 percent by non-commercial gear. Salmon made up about 50 percent of the 1987 harvest, with 80 percent caught by rod and reel, 14 percent by non-commercial gear, and 6 percent by commercial gear.

Non-salmon fish also made up 50 percent of the community's fish harvest, with percentage by method figures only slightly different from salmon. Salmon are an important subsistence resource, but Petersburg residents take most of their fish well away from the Project Area. Since the principal method of harvest is rod and reel, and the Forest Plan Standards and Guidelines mitigate potential effects of logging activities on fish streams, fish are not considered further in this report.

Seals are found in various locations in the vicinity of the Zarembo Island coastline, and are sometimes harvested by Wrangell hunters. Although harvest occurs throughout the year, the number of seal hunters (and associated consumers) is relatively limited and harvest locations other than Zarembo Island

may well be preferred. This information agrees with a recent study on the harvest of harbor seal and sea lion (Wolfe and Mishler, 1993). Some gathering of mussels and abalone was reported, at least traditionally, for the southern portions of Zarembo Island. These activities have been affected by the reported depletion of these resources by divers, especially since traditional access is limited to those areas accessible during low tides. Seaweed is also reported to be gathered at low tides on reefs off Zarembo Island. Again, relatively few individuals are involved in these activities (USDA Forest Service, 1998d).

Deer are thus the primary subsistence resource of potential concern for Petersburg as well. The TRUCS land use map produced for Petersburg for deer indicates that residents hunted the northern part of Zarembo Island, but more the western portion of the island than the eastern part (ADF&G, 1990b). Based on interviews conducted in Petersburg for the Skipping Cow Timber Sale, it is clear that Petersburg residents currently make full use of the road system on Zarembo Island and use the entire island for deer hunting (although not as much as hunters from Wrangell).

ADF&G harvest information for the Project Area is summarized in Tables 3-14 and 3-15. Deer harvest is quite high, although it has not always been so, but overall activity in terms of other subsistence resources is quite low for all of Zarembo Island (Table 3-14). Trapping activity is limited. There are no marten on Zarembo Island, and for other species trappers concentrate on areas closer to their community of residence (Wrangell or Petersburg) or areas with higher populations of the target species. The bear population on Zarembo is universally reported to be low, and bear hunting on the island is minimal or non-existent. Bear tend to be taken only on an opportunistic basis. Opinions vary on the health and density of the wolf population on Zarembo Island. The most common perception was that the wolf population is presently quite low; observations occur relatively infrequently and have only involved single wolves to date. Some hunters remember seeing healthy wolf packs on Zarembo Island, but most of these reports are from five years ago or more. Trapping harvests of wolves from Zarembo Island have been relatively few in the recent past (Table 3-14). Whether this is due to the relatively small wolf population, the relatively few people who trap on Zarembo Island, or both, cannot be determined from the information available.

There has been a dramatic increase in deer harvest from Zarembo Island since 1991 and especially since 1995 (Tables 3-16 and 3-17). This increased harvest is perceived to have been the direct result of a healthy and growing deer population on Zarembo Island, but may in fact be due to other factors as well. Many hunters believe that a healthy wolf population indicates fewer deer, while few wolves indicate at least the possibility for many deer. Therefore, they believe that some wolves exist on Zarembo Island, but not a great number.

Table 3-16
Annual Deer Harvest Statistics by Community for WAA 1905 Regulatory Years 1987-1997 (11 years)

Regulatory Year	Wrangell	Petersburg	Other	Total
1987	0	10	0	10
1988	6	5	0	11
1989	5	14	7	26
1990	27	10	17	54
1991	117	0	0	117
1992	85	0	0	85
1993	111	7	6	124
1994	163	0	0	163
1995	265	43	0	308
1996	255	37	17	309
1997	249	123	35	407
Total	**1,283**	**249**	**82**	**1,614**

Source: ADF&G Southeast Alaska Deer Hunter Survey Summaries (1987-1997)

Table 3-17
Community Dependence Upon Deer Harvest from WAA 1905 Regulatory Years 1987-1997 (11 years)

Regulatory Year	Wrangell Reported Deer Harvest			Petersburg Reported Deer Harvest		
		WAA 1905			WAA 1905	
	Total #	#	%	Total #	#	%
1987	321	0	0.0	1,439	10	0.7
1988	361	6	1.7	1,180	5	0.4
1989	386	5	1.3	1,102	14	1.3
1990	327	27	8.3	1,534	10	0.7
1991	262	117	44.7	642	0	0.0
1992	423	85	20.1	916	0	0.0
1993	436	111	25.5	937	7	0.7
1994	458	163	35.6	1,019	0	0.0
1995	586	265	45.2	742	43	5.8
1996	467	255	54.60	495	37	7.5
1997	420	249	59.29	665	123	18.5
Total	**4,447**	**1,283**	**28.85**	**10,671**	**249**	**2.3**

Source: ADF&G Southeast Alaska Deer Hunter Survey Summaries (1987-1997)

Documented harvest of deer on Zarembo Island, which has increased steadily since 1987, is presently at an historic peak and presumably still increasing (Tables 3-16 and 3-17). Zarembo Island is the only area in GMU 3 where annual deer harvest is increasing. The percentage of total community deer harvest that comes from Zarembo Island has steadily increased for Wrangell, from 0 percent in 1987 to about 60 percent in 1997, with absolute harvest numbers remaining fairly constant from 1995 to 1997. Petersburg residents have more recently

begun to use Zarembo Island apparently in response to reduced hunter success in other areas. Petersburg residents took 6 percent of their community's deer from Zarembo Island in 1995. This increased to 19 percent by 1997 and accounted for the majority of the increased take from Zarembo Island over this period (Table 3-16). This is discussed in more detail in the Subsistence Resource Report.

General Wrangell and Petersburg Deer Hunting Land Use Patterns

The general land use pattern for deer hunters from Wrangell and Petersburg is generally understood to be based on the following basic principles or factors (abstracted from Cohen, 1989; Doerr, 1986; Fay, 1986; Subsistence Resource Report; IAI, 1998; and Smythe, 1988—although many others have also recognized the pattern):

1. Hunters generally prefer to hunt closer to, rather than farther from, their community of residence.
2. Management regulations can greatly affect areas hunted, and strongly modify the first factor (especially outright closures, but also bag limits and length of season—a bigger bag limit and a longer season is preferred).
3. Access and the availability of the means of access greatly affect, and in some cases determine, where an individual can hunt deer.
4. Motivation for hunting—efficient harvest of meat, recreation remote from other people, "fair chase," or a mixture of these or others—greatly affects the deer hunting areas that people choose.
5. Time available, while part of the first factor, deserves its own consideration.

This is not an exhaustive list of factors, but it does include some of the more significant considerations.

A common observation is that hunters go where there are deer and where they have the highest chance of a successful hunt, which is why so many hunters now make Zarembo Island their destination of choice. The perception is that the deer population on Zarembo Island has increased greatly in the recent past. Certainly, the reported harvest of deer has increased (Table 3-16). Whether this increased harvest in recent years is due to an increased deer population, or merely increased hunting, is not known for certain. Many hunters credit the logging of Zarembo Island with creating an increase in deer forage, while others say that the logging may have coincided with a natural increase in the deer population cycle. In any event, the network of logging roads and access for boats provided by St. John Harbor and Roosevelt Harbor, combined with the close proximity to the communities, has encouraged more hunters from Wrangell and Petersburg to try,

and to return to, Zarembo Island for deer hunting (USDA Forest Service, 1998d; Table 3-17).

The Subsistence Resource Report discusses the historical annual deer harvest patterns for Wrangell and Petersburg since 1960 and addresses variations in community harvest resulting from natural cyclical conditions. It also examines the geographical distribution of harvest that has developed in GMU 3 since 1987 in response to such conditions. The regulatory history of deer harvest in GMU 3 generally mirrors the abundance and distribution of deer. Hunting pressure, or level of effort, has been regulated on Zarembo Island (and the rest of GMU 3) with two main tools: the length of the season and bag limits. A simple chronology of deer regulation in GMU 3 is as follows:

1960s All of Southeast Alaska open with a general bag limit of 4 deer

1970 Bag limit on Mitkof Island reduced to 2 bucks, remains at 4 deer for other parts of GMU 3 (GMU 4 remains at 4 deer)

1971 Bag limit for GMU 3 reduced to 3 deer in general and to 2 bucks for Mitkof, Wrangell, Etolin, and Woronofski Islands

1972 Bag limit for GMU 3 reduced to 2 bucks

1973 Bag limit in GMU 3 reduced to 1 buck

1975 All of GMU 3 closed to deer hunting

1980 GMU 3 south of Sumner Strait opened to deer hunting (4 month season) with a bag limit of 1 antlered deer (includes Zarembo, Woronofski, and Etolin Islands)

1988 GMU 3 south of Sumner Strait bag limit increased to 2 antlered deer

1991 Mitkof Island and Northeast Kupreanof Island opened for a 2-week long season registration hunt with a bag limit of 1 antlered deer

1993 All of GMU 3, except for Mitkof Island and Northeast Kupreanof Island, opened for a 4-month season with a bag limit of 2 antlered deer

1995 Registration aspect of Mitkof/Northeast Kupreanof hunt dropped

Residents of both Wrangell and Petersburg have greatly increased their hunting in GMU 3 since 1960 and reduced efforts in more distant areas, such as GMU 2 (Prince of Wales Island) and the ABC Islands. These patterns are discussed in more detail in the Subsistence Resource Report.

Deer harvest within GMU 3 increased from 1987 to 1993. This is likely due to Wrangell hunters taking more deer on Zarembo Island and Petersburg hunters taking deer from Mitkof and Kupreanof Islands. Total take for GMU 3 declined in 1994 from 1993, reflecting declines in harvest from Mitkof and Kupreanof Islands (primarily Petersburg hunters) which were greater than the small increase of harvest from Zarembo Island (Wrangell hunters). In 1995, deer harvest on

Mitkof and Kupreanof Islands increased slightly with Zarembo Island experiencing a much larger increase. This is the first year that Petersburg hunters reported harvesting deer on Zarembo Island, and they account for a large portion of the increased harvest on Zarembo in 1995. A larger portion of the increased deer harvest from Zarembo Island in 1995, however, was due to increased activity by hunters from Wrangell. Harvest increases in GMU 3 since 1995 have been due to the increased use of Zarembo Island by Petersburg hunters. Because of the short time series, it is not clear if this is merely a short-term "blip" in the historic Petersburg deer hunting pattern or if it is indicative of a long-term trend for increased use of Zarembo Island. Both Wrangell and Petersburg have demonstrated a tendency for increased reliance on deer from GMU 3, and Zarembo Island is the primary deer hunting location in GMU 3.

Ease and expense of access also significantly influence the geographic distribution of deer harvest. The ABC Islands have a higher bag limit than any other local deer hunting areas for Wrangell and Petersburg hunters, and have historically been important areas for them to hunt. This was especially true for Petersburg, which is closer to the ABC Islands, and farther from other local areas (with lower bag limits) with available deer than Wrangell. Petersburg may also have had a greater number of larger fishing boats which fished in the area of the ABC Islands. Both communities harvest a lower percentage of their collective deer from the ABC Islands now than they did in the past, with Petersburg continuing to depend more on GMU 4 than Wrangell.

Both communities display a pattern of hunting deer closer to their communities, however, and are probably responding to similar factors. Prior to the development of road systems on the various islands, access to deer was primarily by boat and foot, and travel to an area with a more generous bag limit was justified in terms of expense and time. With the development of roads on the islands, the increased availability of 4-wheel-drive vehicles, and the ability to transport them in boats, came an increase in local hunting. This coincided with an increase in the local deer population and a liberalization of local bag limits.

That hunters prefer the convenience, as well as the time and expense savings, of hunting more locally can be demonstrated by the percentage of deer Petersburg hunters take on Mitkof Island (with a bag limit of 1), and more generally the percentage of deer Wrangell and Petersburg hunters take in GMU 3 (with a bag limit of 2). There are many fond remembrances of deer hunting in the ABC Islands, especially in Wrangell, by people who now generally hunt closer areas on the weekend. They prefer many shorter hunts to one longer one. Others continue to hunt the ABC Islands, especially from Petersburg. For Wrangell hunters, however, the health of the local deer population and the lack of easy access to GMU 4, combined with the ease of access to GMU 3, has resulted in a great and increasing dependence for deer upon GMU 3 in general, and Zarembo Island in particular. There are indications that this may be increasingly true for Petersburg as well.

Effects

Deer hunting is the major subsistence use in the Project Area as well as on Zarembo Island as a whole. The use of other subsistence resources is very low. Therefore, harvest and road building would not have a significant effect on these resources. The direct, project-related effects on the deer population would also be minor.

Deer Habitat Effects

The Forest Plan indicates that winter habitat is especially important for Sitka Black-tailed deer. Winter range is to be identified before and as part of the project analysis, and is to be protected to the extent possible. Winter range is, in most cases, the most limiting factor for deer. According to the observations of ADF&G biologists, current deer forage on Zarembo Island is so abundant that even though deer populations are high, there are no signs of habitat degradation or over-grazing. Predator populations on Zarembo Island are low (USDA Forest Service, 1998d). Thus, winter habitat certainly appears to be the major natural limiting factor at present for deer on Zarembo Island.

Winter deer habitat in the Project Area was mapped, and changes in winter deer habitat were used to characterize the different alternatives. All of the alternatives would increase low value deer habitat, as would be expected, since the action alternatives essentially convert higher value winter deer habitat into lower value winter deer habitat by the harvest of timber. Most of the proposed timber harvest is targeted on medium- and high-volume old growth. However, the old growth within the Project Area is relatively low value winter deer habitat. The action alternatives reduce the existing high volume old growth by 9.3 to 19.3 percent, and the existing medium volume old growth by 15.7 to 18.8 percent. The same action alternatives reduce the existing high value deer winter habitat by 2.0 to 3.3 percent and the existing medium value deer winter habitat by 2.8 to 4.7 percent. In terms of wildlife effects, this is termed a "minor" effect (see Issue 3: Wildlife section). In terms of direct effects upon subsistence activities on Zarembo Island, this decrease should have little or no effect. The potential cumulative effects cannot be differentiated by alternative.

Deer populations are likely to remain high until the food supply or weather conditions change for the worse. High forage areas (recent harvest units) will eventually grow out of the forage producing stage. The proposed harvest units would, in time, replace these areas as forage producers. However, this is unlikely to offset the effects of a series of harsh winters.

All of the proposed alternatives would harvest old growth forest. However, due to the elevation, aspect, and snow levels, these areas are generally not high quality deer winter habitat. Therefore, the effects of any of the proposed alternatives, even combined with expected actions, would not be significant.

The effects would be minor and the differences between alternatives would not have a measurable difference. Any of the action alternatives would be likely to exacerbate adverse conditions when a series of harsh winters occurs, but the added effect would be minor. Maintaining current conditions (No Action) would not have a significant mitigating effect on deer winter habitat compared to the adverse effects caused by a series of harsh winters. In summary, subsistence deer hunting will be affected primarily by weather conditions and by natural population cycles rather than the proposed alternatives, given the low amount of high quality winter deer habitat on Zarembo Island.

Road Effects

Zarembo Island is currently a well-roaded island, and almost all hunters use the roads to some extent to access the areas that they hunt. Most of these hunters enter via St. John or Roosevelt harbors by boat and either bring motor vehicles with them or use those kept on the island. Some of these hunters confine their activities relatively close to the road system, whereas others hunt on foot at considerable distances from wherever they finally drive. Some hunters using these harbors do not use vehicles, they hike in from the harbor on foot. These hunters may or may not hike on the roads for some distance. A small percentage of hunters use boats to access the island at places other than St. John and Roosevelt harbors. They either hunt the beaches or walk inland on foot. Even they recognize that Zarembo Island represents a certain kind of deer hunting experience that is dependent on its fairly recent history of timber harvest (and the associated road system). All deer hunters interviewed during the field process for preparation of the Subsistence Resource Report stated that they hunted Zarembo Island when they wanted to maximize their chances to take a deer.

Those hunters who dislike knowing that other hunters are around hunt Zarembo Island less often, or at different times, than those who are less concerned about the presence of others. Similarly, those hunters who prefer not to hunt off roads tend to hunt Zarembo Island less frequently, and in different areas, than those who do prefer to hunt off roads. Even for hunters who hike in from the beach, however, Zarembo Island is reported to be the most productive area for the least amount of effort. Most hunters attribute this to the abundant deer forage created by past timber harvest (those clearcuts now reaching the peak of their value for deer food) and the recent series of mild winters.

It is not likely that the construction of additional roads, or the closure of some existing roads, would affect the present pattern of deer hunting on Zarembo Island in a fundamental way. Hunters do choose the specific areas they plan to hunt on the basis of anticipated success. Other factors are important, perhaps more important, for some hunters, but on Zarembo Island the abundance and availability of deer seem to be the most important operative factors.

Each proposed action alternative has two road management plans. The subsistence effects of these plans cannot be precisely anticipated, but the alternatives can be ranked in terms of road effects, which are assumed to vary directly with the amount of road to be built and to remain open. Alternative 3 would build the most roads and would have the greatest effect. Alternative 5 would build a similar amount of road, except in the Nesbitt area where it would build nearly 2 miles less road. Alternative 2 would build the same roads as Alternative 3 except in the Middle Meter Bight drainage where it would not build roads. Alternative 4 would build the least new road and would have the smallest road effects. Whether road effects are positive or negative for subsistence on Zarembo Island is not clear. Many current subsistence users desire more roads in order to increase access to more parts of the island. They say that this would spread effort out more and increase the enjoyment of the hunt. Hunters who prefer to hunt clearcuts saw a clear benefit from the proposed timber harvest, with or without new roads. For hunters on foot, fewer open road miles may well be positive, although they tend to hunt areas other than Zarembo Island when they are more interested in a "quality" hunt rather than the meat that the hunt produces. However, other hunters prefer to hike into areas away from roads. All hunters agree that access is an important factor, so that if a large part of the road system were to be closed, it is likely that the number of deer harvested would decrease. However, none of the proposed road management plans would close roads that are currently open.

The short-term and long-term effects of additional road construction may also be perceived as positive or negative. Increased access and increased forage production may result in greater opportunities to harvest deer in the short term. If winters are more severe than in the recent past, and after clearcuts grow beyond the productive deer forage stage, additional roads may have a cumulative negative effect (especially if they facilitate predation by wolves). Again, given the scale of the existing road network on Zarembo Island, and the relatively minor differences among the alternatives proposed (even at the extremes of "build all the roads proposed and keep them open" and "no new roads"), it is unlikely that the measurable consequences of whatever action is chosen will be much different from those of any of the other alternatives. Specific closures will directly affect those hunters who used those roads (or would wish to use them in the future) to access certain areas, but documentation of road use on Zarembo Island does not exist in that detailed form.

Potential Competitive Effects

Wrangell and Petersburg take the vast majority of deer harvested on Zarembo Island. Relatively few deer were taken from the island prior to 1991. Wrangell and Petersburg residents have taken almost all of the documented deer harvest from Zarembo Island since 1991. Some concern was expressed that in 1997 Ketchikan residents reported taking 15 deer from Zarembo Island, whereas in previous years they had not reported any significant activity. While this

represents less than 4 percent of the 1997 deer harvest from Zarembo Island, some people raised the possibility that it could be an indication of increased competition from Ketchikan hunters in the future. This document cannot address this issue based on the reports from one year. Ketchikan is a substantial distance from Zarembo Island, and Prince of Wales Island is a preferred and closer area for Ketchikan residents. Further, it is not unusual for residents of one community who are visiting another community to hunt in that community's local area while there—but not to make it part of their "regular" hunting area. It is not likely that the proposed actions will change the ease of access (in either direction) to encourage or discourage hunters from any community. Competition from other areas will ultimately depend more on the availability of deer in areas more typically used by those other hunters than on the effects of the proposed action on the Project Area (and Zarembo Island as a whole).

If the trends of the last three documented deer seasons (1995 to 1997) continue, it is possible that competitive effects could develop for Wrangell and Petersburg hunters. As discussed above, the total deer harvest for Wrangell has been reasonably stable and at a lower level than that of Petersburg. Wrangell hunters increased their deer harvest from Zarembo Island every year from 1987 to 1995, but since then (admittedly a short time series) their take has been stable. Thus, since more deer are available on Zarembo Island, this is one indirect measure that Wrangell's "community demand" for deer may be met at present. On the other hand, the total community harvest of deer for Petersburg has shown a significant decline since the late 1980s, but has historically been several times that of Wrangell. Petersburg hunters recently started to harvest deer on Zarembo Island, and in 1997 such deer comprised 19 percent of the community's total deer. Further, Peterburg's overall community take of deer increased from 1996 to 1997 by approximately the same amount as the harvest of deer on Zarembo Island by Petersburg hunters.

It is reasonable to suppose that this is a response to decreased success in other parts of their normal use area, along with the observation that the deer population on Zarembo Island is quite large and the knowledge that Wrangell hunters have had very good success there. Given the demonstrated Petersburg demand for deer of up to twice its current community harvest, and the proximity of Zarembo Island to Petersburg, it is conceivable that Petersburg hunters could begin to hunt Zarembo Island in such numbers as to decrease the success rate of Wrangell hunters. Harsh winters would increase this possibility. Given the flexible and adaptive nature of the subsistence land use patterns of the two communities, it is difficult to argue that one has a more "customary and traditional" use of Zarembo Island than the other. Wrangell clearly does have a longer documented record of deer harvest from Zarembo Island, however, and a greater degree of dependence upon it as a source of deer for the community hunts. In terms of aboriginal use, all clans from Wrangell have access to Zarembo Island and rights to use its resources.

Demand/Habitat Cumulative Effects

The only available measures of deer population estimates (deer availability) are those from the latest Forest Plan analysis (TLMP FEIS, 1997). These estimates are derived from the deer habitat capability model (HCM). This model does not project actual deer numbers. Rather, deer populations are typically below HCM values, although in some circumstances actual deer population may be higher (TLMP FEIS, 1997: page 3-368). In fact, Zarembo Island may be an example where the present deer population exceeds the HCM's value. This is because the present deer HCM is based primarily on deer winter habitat as the primary population limiting factor. Zarembo Island has experienced a relatively long period of mild winters, has a low natural predation level, and has abundant deer forage, which are all factors that favor a larger deer population rather than a smaller one.

Demand for deer, especially future demand, is also difficult to predict. The Forest Plan addresses the demand for deer at the community level, through an examination of past harvest patterns and projected community growth, compared to the deer projected to be available in those areas most commonly used by the community's deer hunters in the past. The Forest Plan deer HCM only projects results for all WAAs at the present "pre-existing" condition (1995) and the years 2005 and 2095. These results are required to discuss the deer available to community hunters within their normal hunting territory. It is also prudent to use the Forest Plan's projected demand for deer for this hunting area. Thus, this discussion draws from the Forest Plan and is regional in nature (rather than focused on Zarembo Island and the Project Area as such). Given the regional nature of the available data, the following discussion situates the proposed Skipping Cow Timber Sale alternatives in the context of the larger-scale alternatives addressed in the Forest Plan.

For the main use area of Wrangell hunters, the Forest Plan concludes that all but the most extreme timber harvest alternatives will continue to provide sufficient deer habitat capability to satisfy the demand for deer for all hunters through 2005, and for all rural hunters through 2095 (TLMP FEIS, 1997: page 3-675). The eventual projected shortfall is due in a small part to deer habitat degradation, but primarily to the increased demand for deer through time due to increased human population. For the main use area of Petersburg hunters, the Forest Plan concludes the same thing. All but the most extreme timber harvest alternatives will continue to provide sufficient deer habitat capability to satisfy the demand for deer for all hunters through 2005, and for all rural hunters through 2095 (TLMP FEIS, 1997: page 3-625). Again, the eventual projected shortfall is due in a small part to deer habitat degradation, but primarily to the increased demand for deer through time due to human population increases. The most extreme proposed alternative for the Skipping Cow Timber Sale reflects

only a median Forest Plan alternative. Thus, other things being equal, effects on Zarembo Island would be expected to be small or nonexistent.

Zarembo Island is, however, currently the most important WAA for Wrangell hunters for deer, and is increasingly important for Petersburg hunters. Further, while Zarembo Island is currently very rich in deer forage, it has a relatively little amount of high value winter deer habitat. Zarembo Island has a great deal of low and medium value winter deer habitat which is most useful in mild and moderate winters, but which provides little protection or forage for deer in years of heavy snow. It must again be stressed that the Forest Service's deer demand/ availability projections are based on deer HCM values, and do not take natural fluctuations due to weather, increased predation, or other sources of variation into account. Such cyclical factors will almost certainly restrict the deer available to hunters within Wrangell's normal hunting territory much more severely than is projected in the Forest Plan's normative discussion. Thus, in the normal cycle of events, a restriction on deer hunting within the Wrangell use area, relative to current use, is quite likely. Petersburg hunters may also be affected in a similar way, if current trends for their increasing use of Zarembo Island continue. Indeed, the increased use of Zarembo Island by Petersburg hunters may be due to their already being affected by decreased hunting success in other parts of their subsistence use area.

ANILCA Section 810 Concerns

The Forest Plan (TLMP FEIS, 1997) concludes that for Wrangell and Petersburg residents, all Forest Plan alternatives would provide adequate deer to satisfy all demand for deer through 2005. Demand for all rural hunters could be satisfied (although just barely) through 2095 for all alternatives for those same areas, except for Alternatives 7 and 9, which proposed the most timber harvest. No alternative would satisfy the demand for deer for all hunters through 2095 for those areas most important to Wrangell and Petersburg hunters.

For reasons summarized above and discussed in the Subsistence Resource Report, it is likely that the current harvest of deer from Zarembo Island is at an historical and unsustainable peak. Thus, future detrimental subsistence effects are inevitable, and have been discussed in terms of "cumulative" effects. They are not the result of the proposed actions for the Skipping Cow Timber Sale, although the action alternatives could contribute an additional incremental (but probably unmeasurable) increase to the potential cumulative effects. Rather, such effects will result from increased demand due to increased human population, the almost inevitable decrease in deer population resulting from harsher winter conditions, and the possible competitive effects of increased harvest of deer from Zarembo Island by hunters from Petersburg.

An ANILCA 810 hearing was held in Wrangell, the community most likely to be affected by any change in subsistence resource availability on Zarembo Island.

Issue 4: Subsistence

Three individuals from Wrangell that regularly use Zarembo Island for subsistence testified at the hearing. All were in favor of leaving new roads ungated to allow access for hunting. One also stated that access for berry-picking was important to many people (see Appendix G).

Issue 5: Wind Ecology

Introduction

Portions of the Project Area have received catastrophic damage from wind storms in the past. Much of the forest in the Nesbitt Creek area originated after a wind storm blew down the existing forest approximately 250 years ago. Other portions of the forest originated approximately 150 years ago, probably after a similar large-scale wind storm. Harvesting 40 to 100 acre patches of forest now may result in an increased risk of blowdown to adjacent forest. This section discusses how the action alternatives would utilize knowledge of the ecology of the area and past events to reduce the risk of catastrophic blowdown.

Forest Stand Dynamics

The interaction of climate and topography is an important factor in the ecological characteristics of a landscape. Understanding these characteristics is important in managing an area. Zarembo Island has a maritime climate, resulting from the influence of the Pacific Ocean. This maritime effect results in a more mild climate than would otherwise be expected for these latitudes. However, the ocean influence also results in periodic severe wind storms, mostly in the early fall. These infrequent storms, which generally come from the south/southwest, have caused massive windthrow of trees. The result of windthrow on the forest landscape is a mosaic of stands of different ages and types. Forest development following disturbance is described in *Forest Stand Dynamics* (Oliver and Larson, 1996), is summarized below, and is displayed in Figures 3-8 and 3-9.

Stand Initiation—The stand initiation stage begins after large-scale natural or human-caused disturbance. The former overstory is gone and a new stand begins to grow from seedlings in the understory or from seeds from adjacent trees. This stage is characterized by a wide variety of plant species and continues until a new tree canopy forms and begins to shade out the understory. This generally occurs in 25 to 35 years in Southeast Alaska (Alaback, 1982).

Stem Exclusion—The stem exclusion stage follows the stand initiation stage and is characterized by high tree mortality. Trees die as they grow bigger and get crowded out. Regeneration is precluded by the thick canopy which restricts growing space and light. There are few understory plants due to a lack of light on the forest floor. This stage appears to last about 100 years on most sites in Southeast Alaska.

Understory Reinitiation—The understory reinitiation stage begins when the canopy opens up as trees mature and die from various causes. As space and light become available, understory plants appear on the forest floor and new trees establish and grow. This generally lasts for well over 100 years. Depending on

the frequency of major storms, many stands on exposed slopes never progress beyond this stage.

Old Growth—The old-growth stage, as used in this document, appears when the stand has many small groups of trees or individual trees of different ages (Oliver and Larson, 1996). The stand does not have a distinct age. Stand structure characteristics traditionally associated with old growth exist, including large and deformed trees with heavy limbs, standing dead trees (snags), multiple canopy layers, and large accumulations of large woody debris on the forest floor and in streams. Death of one or a few overstory trees permits light to reach the forest floor and small patches of young trees to grow. This process is called gap phase dynamics (Oliver and Larson, 1996). This stage is usually reached between 250 and 600 years.

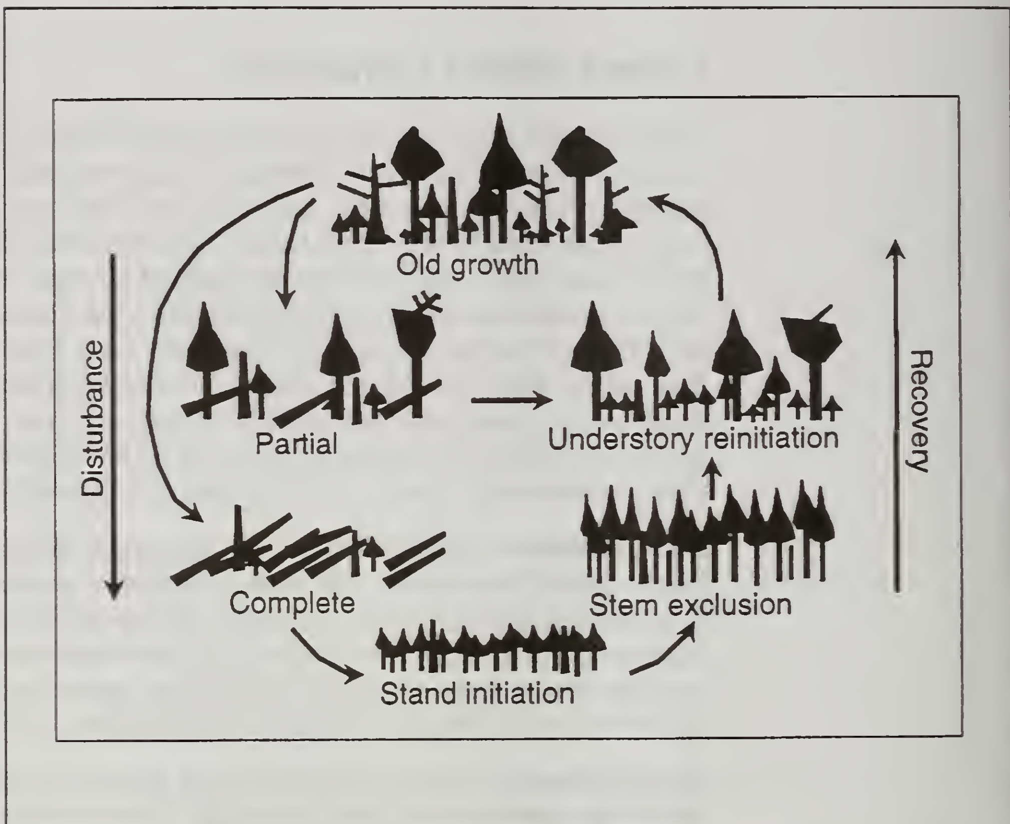


Figure 3-8

Disturbance and Recovery in Forests that Occur on Wind-protected Landscapes where Small-scale Blowdown Predominates (Source: Nowacki and Kramer, 1998)

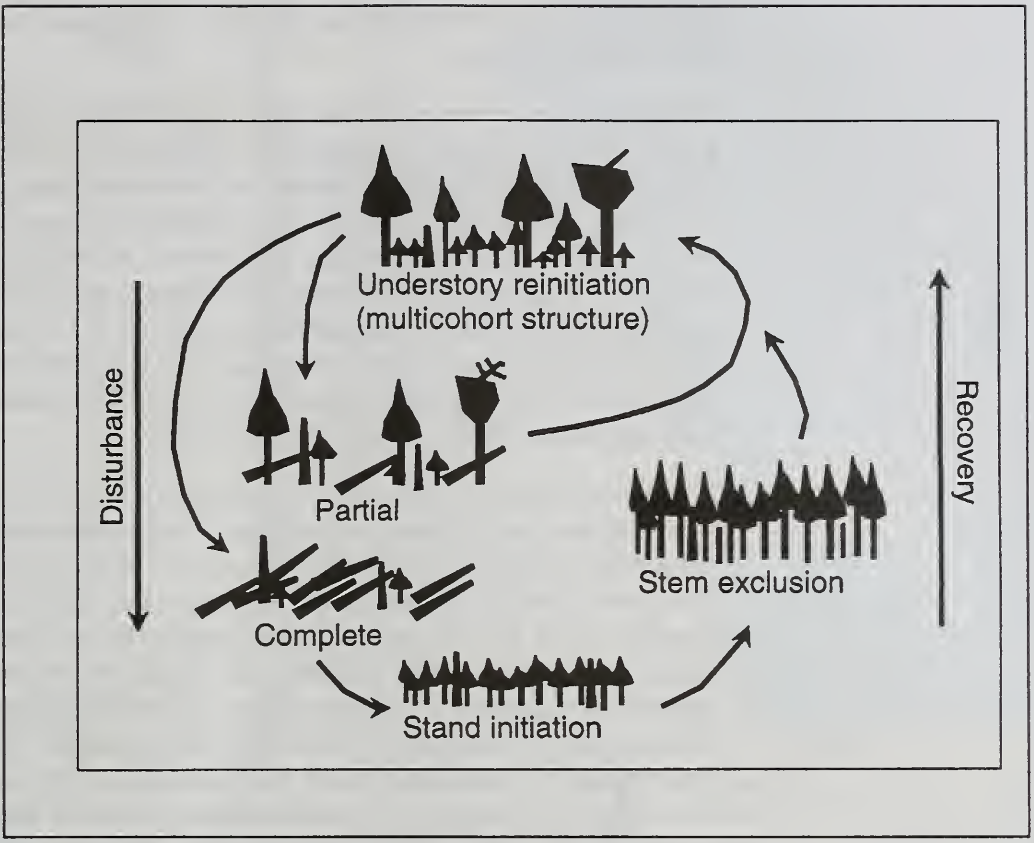


Figure 3-9
Disturbance and Recovery in Forests that Occur on Wind-exposed Landscapes where Large-scale Blowdown Predominates (Source: Nowacki and Kramer, 1998)

The progression to the old growth stage for productive western hemlock and western hemlock/Sitka spruce stands usually takes place in wind-sheltered areas (Figure 3-8). In contrast, stands occurring on wind-exposed landscapes (Figure 3-9) seldom reach old growth because storm intervals seem to be frequent enough to restrict forests to the first three stages of development (Kramer, 1997).

A variety of successional pathways were found to exist on wind-exposed landscapes (Nowacki and Kramer, 1998). A common progression starts with a partial disturbance. Over time, the stand moves into the understory reinitiation stage. In this stage, two distinct age classes are present in the overstory: (1) the individuals left after the stand initiating the storm, and (2) the trees that started growing right after this storm. Additionally, there is a third age class beginning to develop in the understory. At this point, due to the frequency of major storms, the stand is partially disturbed again. If all of the oldest trees blow over, the stand continues to develop with two age classes. If not, the stand structure becomes more complex, now containing three age classes. Many stands never

develop more than three age classes, as the oldest age class continually blows over in major storms.

Windthrow is the dominant disturbance agent in the Project Area. It occurs in two forms: small-scale and large-scale (Figure 3-10). Most of the island is subject to small-scale windthrow events. Individual trees, or small groups of trees, blow over during wind storms, opening the canopy and allowing young trees to grow to fill the openings. This results in complex, multi-aged stands. Studies in Southeast Alaska indicate that these small-scale events occur nearly constantly and result in openings ranging from 6 to 13 percent of the canopy. Most openings are less than 1,080 square feet and are created by the loss of three or less trees. The majority of these openings result from stem-snap, causing little soil disturbance (Nowacki and Kramer, 1998).

Some areas, those not protected by topographic barriers from the severe effects of infrequent, major storms, are subject to large-scale windthrow events and catastrophic damage. Entire stands have been blown down in the past. Much of the forest in the middle and upper portions of the Nesbitt Creek drainage and portions of the Vial Creek drainage are subject to the direct effects of these windstorms (Figure 3-10). Catastrophic blowdown can result in a single-generation stand with a uniform canopy or a multi-generation stand with a diverse canopy, depending on the degree of blowdown. Most openings are less than 50 acres. Unlike small-scale wind disturbance, the majority of trees blow over rather than break. This results in the exposure of mineral soil. Catastrophic blowdown events generally reoccur often enough that old-growth conditions are not attained in areas not protected from major storms by topographic features (Nowacki and Kramer, 1998).

The tools that are available for use in maintaining natural disturbance processes at the stand level are discussed in Appendix G of the Forest Plan (TLMP FEIS, 1997). This appendix lists three groupings of silvicultural systems (ways of managing forests for clearly defined goals [Smith, 1962]). These groupings are even-aged, two-aged, and uneven-aged systems. Even-aged, two-aged, and uneven-aged systems are proposed for the action alternatives. The silvicultural system applied to each proposed unit is listed on the individual unit cards in Appendix C.

Even-aged Systems

Even-aged systems produce stands that consist of trees of the same age or nearly the same age. This system mimics the results of stand replacing disturbance events (TLMP FEIS, 1997) and moves units to the stand initiation stage. Clearcutting is the most commonly used method in Southeast Alaska to achieve even-aged results. Except for Alternative 2, clearcutting would be included in all alternatives to varying degrees in order to maintain a mixture of stand development stages at the landscape level and for logging practicality. Alternative 4, which would use clearcutting to harvest some wind-prone units in

...skippingcowlamlsps-fig11x17.aml - May 16, 2000 wind.ps

the Vial Creek drainage, would implement an uneven-aged management system for wind-prone stands in the Nesbitt drainage.

Two-aged Systems

Two-aged systems produce stands that contain two age classes. These systems mimic the results of partial disturbance events and create units that closely resemble the understory reinitiation stage. The resulting stand may be two-aged, three-aged, or trend towards an uneven-aged condition due to the retention of reserve trees that may represent more than one age class (TLMP FEIS, 1997: G-11). As implemented in Alternative 2 and in some portions of Alternative 4, approximately 20 to 30 percent of trees over 9 inches DBH are retained to carry over biological legacies of the previous stand into the new stand. Seeds from trees that are left, especially yellow-cedar and Sitka spruce will be important in maintaining these species on the site (TLMP FEIS, 1997: G-10).

This harvest system will allow many natural disturbance processes to occur in harvest units. The variety of possible outcomes after harvest will provide a great deal of new information on how to better maintain natural ecosystem function through management. For example in forests directly exposed to chronic windthrow, the trees greater than 38-inches in diameter may blow over or snap off as they decay over time. This will provide the forest floor with large deadwood and may serve an important role in rejuvenating site productivity through uprooting and soil churning (Bormann et al., 1995). The gaps created will stimulate understory shrub and forb production and will also give smaller trees and seedlings room to grow. The stand may tend to remain two-aged with remnant trees producing habitat structures for animals and shade for light-sensitive understory plants (Nowacki and Kramer, 1998). In wind-sheltered areas most of the trees left after harvest are expected to remain standing. Over time, these stands may trend toward uneven age conditions (TLMP FEIS, 1997: Appendix G) and maintain much of the original old-growth-like structure (Pojar and Mackinnon, 1994). In both areas, it is anticipated that the time these two-aged stands spend in the development stage with the least biological diversity, the stem exclusion stage, will be greatly reduced compared to traditional clearcut harvest techniques.

Uneven-aged Systems

Uneven-aged systems produce multi-aged and multi-layered stands similar to stands produced by gap-phase blowdown. Uneven-aged management techniques include single-tree selection, small group selection, and removing a fixed percentage of the trees in the stand. As implemented in Alternative 4, approximately 75 percent of the trees over 9 inches DBH would be retained. Small diameter trees would also be retained. Similar entries would be repeated on a 20 to 30 year cycle, resulting in a complex, multi-aged stand. The helicopter yarding system used in Alternative 4 allows great flexibility in harvesting trees while protecting the trees to be left.

This harvest system will allow many natural disturbance processes to occur in harvest units. In forests directly exposed to chronic windthrow, the trees greater than 38-inches in diameter may blow over or snap off as they decay over time. This will provide the forest floor with large deadwood and may serve an important role in rejuvenating site productivity through uprooting and soil churning (Bormann et al., 1995). The gaps created will stimulate understory shrub and forb production and will also give the less than 16-inch-diameter trees and the new young trees room to grow. These stands should maintain much of the original old-growth-like structure.

Effects

Alternative 1 (No Action)

Alternative 1 would not result in an increased risk of windthrow over natural conditions at this time. Future timber sales would be likely to have similar effects as those described below. If natural blowdown occurs, the area would be analyzed through NEPA and salvage of windthrown trees would be considered.

Alternative 2

Alternative 2 harvests approximately 719 acres in areas that have been subject to severe wind storms in the past (Units 5, 6, 8 through 11, and 18 through 26) (Table 3-18). The leave trees (20 to 30 percent of the trees over 9 inches DBH) would be scattered through the harvest units, especially near the boundaries. The units would closely resemble the understory reinitiation stage following partial disturbance. The leave trees would be subject to windthrow, as would the areas along the edges of the harvest units and along the roads. Approximately 11.5 miles of "edge" would be created around units in the wind-prone areas and approximately 4.9 miles of "edge" would be created along stream buffers. The leave trees may create a "feathering" effect, lessening the strength of the wind and reducing the edge effect compared to Alternatives 3, 5 and portions of Alternative 4. This effect would be enhanced by feathering the boundaries and by placing boundaries along terrain breaks, ridges, and creeks. However, some windthrow of leave trees within the unit and in the adjacent forest would be likely. This would emulate natural windthrow patterns over time, creating natural soil mixing as root-wads are up-turned. Road clearing in both the Nesbitt Creek and Vial Creek drainages would be parallel to the prevailing wind. This could funnel winds along the road corridors and increase the susceptibility of trees along the corridors to windthrow. Overall, there would be a higher risk of windthrow than under Alternative 1. If blowdown occurs, the area would be analyzed through NEPA and salvage of windthrown trees would be considered.

Table 3-18
Harvest in Wind-prone Areas by Timber Harvest by Alternative

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Even-aged Harvest in Wind-prone Areas (approx. acres)	0	0	719	296	520
Two-aged Harvest in Wind-prone Areas (approx. acres)	0	719	0	15	0
Uneven-aged Harvest in Wind-prone Areas (approx. acres)	0	0	0	1,009	0
Unit Boundary Edge (approx. miles)	0	11.5	11.5	5.7	8.2
Stream Buffer Edge (approx. miles)	0	4.9	4.9	1.1	3.3

Note: No edge is assumed to be created by removing 25 percent of the trees greater than 9 inches DBH.

Alternative 3 (Proposed Action)

Alternative 3 would harvest the same units in the windthrow-prone areas as Alternative 2. All units would be clearcut. Reserve trees (approximately 10 percent of the trees over 9 inches DBH and trees less than 9 inches DBH) would be retained in clumps, mostly near the unit boundaries. The units would resemble the stand initiation stage following a stand-replacing disturbance. Since fewer leave trees would be left in the unit, most of the feathering effect would be lost. Some feathering would be created along the edge by avoiding straight boundaries where feasible. Since there would be fewer trees left standing in the units there would be less soil mixing due to windthrow compared to Alternative 2 and portions of Alternative 4. Approximately 11.5 miles of "edge" would be created around units in the wind-prone areas and approximately 4.9 miles of "edge" would be created along stream buffers (Table 3-18). Windthrow in adjacent forest may be somewhat more likely than under Alternative 2. Road clearing in both the Nesbitt Creek and Vial Creek drainages would be parallel to the prevailing wind. This could funnel winds along the road corridors and increase the susceptibility of trees along the corridors to windthrow. As in Alternative 2, salvage of windthrown trees would be considered in a NEPA analysis, should blowdown occur.

Alternative 4

Alternative 4 would not build Road 52033. Therefore, there would not be an increased risk of windthrow from roads in the Nesbitt drainage. Road clearing in the Vial Creek drainage would be parallel to the prevailing wind. This could funnel winds along the road corridor and increase the susceptibility of trees along the corridors to windthrow. Approximately 1,009 acres would be harvested in wind-prone areas in the Nesbitt drainage (Table 3-18). Harvesting in the area west of Nesbitt Creek would be restricted to removing 25 percent of the trees over 9 inches DBH throughout the area. The objective would be to mimic natural small-scale disturbance. This may have the effect of reducing windthrow in the Nesbitt area compared to Alternatives 2, 3, and 5. However,

some windthrow of leave trees within the units would be expected since the area is at high risk for large-scale windthrow even if no harvest occurs. This would emulate natural windthrow patterns over time, creating natural soil mixing as root-wads are up-turned. There would be no large openings created by harvest and, therefore, no large areas of "edge" along unit boundaries or stream buffers. However, the risk of large-scale windthrow may increase, especially in the 150-year old stands near Nesbitt Ridge. These stands have not developed the open canopy stage and the openings created by harvest would expose individual trees to more wind than they are accustomed to. Although the risk of windthrow may be lower than under Alternatives 2 and 3, should blowdown occur, salvage of windthrown trees would be considered and analyzed through NEPA.

Effects to the wind-prone areas in the Vial Creek and Middle Meter Bight areas would be similar to the effects for Alternative 3. Approximately 311 acres would be harvested in wind-prone areas in the Vial Creek and Middle Meter Bight areas. Approximately 5.7 miles of edge would be created around clearcut units in these wind-prone areas and approximately 1.1 miles of edge would be created along stream buffers within, or adjacent to, clearcut units.

Alternative 5

Alternative 5 was designed to respond to recent information on large-scale wind damage in the area. Approximately 520 acres would be harvested in wind-prone areas (Table 3-18). One large unit at the top of the area that has received catastrophic wind damage in the past (Unit 8) would be clearcut. Future harvests along Nesbitt Ridge would be located into the wind. Therefore, the remaining forest would only have harvest-created "edge" on the side located away from the prevailing wind. The area northeast of Unit 8 would be subject to increased risk but not as high as the areas south of Unit 8. Therefore, less windthrow would be expected to occur now and in future entries. The leave area northeast of Unit 8 would be left as a wildlife corridor. This corridor was enlarged to allow for the possibility of windthrow along the northeast boundary of Unit 8. Approximately 8.2 miles of "edge" would be created around units in the wind-prone areas and approximately 3.3 miles of "edge" would be created along stream buffers. The effects to other areas would be similar to the effects for Alternative 3. The units in Alternative 5 would resemble the stand initiation stage following a stand-replacing disturbance.

Alternative 5 would not extend Road 52033 beyond Unit 8. Therefore, less road-related windthrow would occur than in Alternatives 2 and 3 but more would be expected than in Alternative 4. Road clearing in the Vial Creek drainage would be parallel to the prevailing wind. This could funnel winds along the road corridor and increase the susceptibility of trees along the corridor to windthrow. Although this alternative was designed to reduce the risk of large scale, management-induced windthrow. If blowdown does occur, salvage of windthrown trees would be considered and analyzed through NEPA.

Geology, Soils, and Geomorphology

Introduction

This section reviews the existing information for the Skipping Cow Timber Sale for the geological concerns of mineral development and management of karst resources. This section also reviews the soil and geomorphic concerns that include mass wasting, erosion, and soil productivity. A brief description of the affected environment (pre-project) is provided as well as a comparison of the risk related to these conditions for each action alternative. The following sections use information from the Forest Service's GIS database that has been updated through field and aerial photography review of the Project Area.

Geology (Karst and Mineral Resources)

The Project Area is underlain by mostly Tertiary and Quaternary age volcanic rock consisting of basalt and andesite in the south and west, while Tertiary-age granites occur in the northeastern portion of the Project Area (Gehrels and Burg, 1992). There appears to be a complete absence of carbonate rock in the Project Area. Carbonate rock is a necessary component for the development of karst (Baichtal and Swanston, 1996).

The map of the Mineral Development Potential, Wrangell Ranger District, Tongass National Forest, shows no mines or areas of "identified mineral development potential" in the Project Area. Outside the Project Area, zones of identified mineral development potential of the epigenetic vein deposit type occur at the extreme southwestern tip and across the central portion of Zarembo Island. Additionally, three prospects for uranium and gold have been explored along the western and northern coastline of Zarembo Island. All three prospects are outside of the Project Area.

Effects

Karst Resources

Due to the absence of carbonate rock in the Project Area, no karst resources are present and none of the proposed alternatives would affect karst resources.

Mineral Resources

With the exception of rock quarries and borrow pits needed for project-related roads, mining is not part of any of the four alternatives. None of the proposed alternatives would affect the mineral resources in the Project Area. No mining currently occurs in the Project Area, and the mineral potential in the Project Area would not be altered by any of the alternatives. The development of new roads would indirectly increase the accessibility of the area for prospecting if economical mineral deposits exist. Any future mineral development in the Project Area would be subject to Forest Plan guidelines and environmental review under NEPA.

Soils and Geomorphology

Soil development in Southeastern Alaska is influenced by high levels of rainfall, cool marine temperatures, and moderately low yearly soil temperatures. Under these conditions, organic detritus decomposes slowly, resulting in an accumulation of organic material. A thick organic surface horizon composed of forest litter is common on mineral soils. Deep organic soils develop where the movement of water is impeded by bedrock or other restrictive soil horizons. Most areas with organic soils are considered wetlands (Corps, 1987). Mineral soils develop as bedrock, glacial, and alluvial deposits weather. These soils are generally thin and poorly developed on the recently glaciated landforms of Southeast Alaska.

While soils provide the foundation for forest growth and ecosystem health, they can also damage valuable aquatic resources when transported into streams and rivers. Timber harvest and road building can affect the ability of soils to support the forest. For this reason, soils and the geomorphic processes that transport soils to the aquatic environment are discussed together. Geomorphic processes in the forest include a variety of landslide types (mass wasting) and erosion of exposed soil (surface erosion). These processes occur naturally in the forested mountains of Southeast Alaska; however, timber harvest and logging roads can increase the frequency and magnitude of mass wasting and surface erosion, resulting in an accelerated movement of soils from hillslopes to valleys. For mass wasting to impact the aquatic environment, the debris must be delivered to waterbodies. This link between mass wasting features and waterbodies is termed "deliverability."

Physiography, Parent Materials, and Soil Types

The soils and landforms in the Project Area reflect a diverse history that includes Pleistocene glaciers, which covered the island until about 8,000 to 10,000 years ago. The glaciers carved the southwest-draining, U-shaped valley in which Nesbitt Creek flows. The glaciers exposed the basalt and andesite volcanic rocks

of the Quaternary and Tertiary ages while depositing glacial till and lateral moraines along the margins and valley bottom of the Nesbitt Creek valley (Gehrels and Burg, 1992). These rocks and glacial deposits are the parent materials of the soils found in the Project Area.

Soil Productivity

Soils provide the foundation for plant growth and timber health. Soils with particular physical, chemical, and biological characteristics generally support a certain plant community type or association. Deep, well-drained mineral soils are the most productive sites for tree growth, even though tree rooting is generally shallow. Site productivity generally decreases with soil moisture or shallow water tables. Timber site productivity on poorly-drained to very-poorly-drained organic soils is generally much lower than on well-drained mineral soils. Very little quantitative information exists on the long-term timber productivity of certain organic soils. The Forest Plan (TLMP FEIS, 1997) identifies the Kaikli, Karheen, Kitkun, and Maybeso organic soils as problematic and to be avoided in timber sale planning and layout because they are commonly associated with poorly drained soils (including forested wetland types) and have marginal productivity. The Forest Plan also recognizes that these soils occur as inclusions in other soil types across the Forest and allows for the harvest of organic soils up to 2 acres in size. The Wetlands section of this EIS includes additional information concerning soil types associated with wetlands.

Geomorphic Processes—Erosion

Surface erosion, which consists of rills and gullies in unconsolidated material (soil, alluvium, colluvium, till etc.), is virtually non-existent in the forested and non-forested environs of the Tongass National Forest in the absence of management activities. This is because the vegetation, the thick organic duff that blankets the forest floor, and the organic accumulation in wetlands (muskegs) provide very effective erosion protection. Overland flow, a necessary component of surface erosion, is virtually absent because the organic surface horizon of the soils have an infiltration capacity sufficient to absorb most rainfall, and are cohesive and resist erosion when overland flow does occur from either snowmelt or extreme precipitation events.

Timber harvest and road construction can expose the mineral soils underlying the surface organic layer to overland flow. This can occur when yarding or roading activities expose the mineral soil. Road cuts can also intercept the shallow subsurface flow along a hillside and concentrate runoff in ditch lines, which can erode the road surface and deliver sediment to streams at crossings. This process can also increase the effective drainage network in the watersheds as the road ditches intercept runoff and form new channels at cross drains.

Mass Wasting and Harvest on Steep Slopes

Mass wasting in all its various forms (debris avalanches and flows, landslides, rock fall, soil creep) is a natural process in the Tongass National Forest that delivers soil, rock, and debris to the aquatic environment. Mass wasting occurs in undisturbed areas and will continue to occur in the future. Landslides generally occur near the surface as shallow-rapid failures affecting the soil and overlying vegetation. Shallow-rapid failures usually occur when the soil is saturated and its natural cohesion is reduced. Heavy rainfall often triggers shallow-rapid failures. Deep-seated landslides involve failure of the bedrock underlying the soil and while larger, they are infrequent. Deep-seated landslides are generally not affected by timber management.

Management activity such as timber harvest can trigger mass wasting years after the harvest as tree roots decay. Tree roots contribute to the stability of hillslopes, adding strength to the soil by vertically anchoring the soil mantle to fractured bedrock or other stable substrate. Small roots near the surface reinforce the upper soil layer so that it acts as a membrane to provide lateral strength and increased slope stability. After timber harvest, the roots decay, reducing soil strength and the stability of shallow soils on steep slopes. Research in Southeast Alaska suggests that although less than 10 percent of all landslides in the past 20 years were related to timber management, harvest and roads increase the potential for landslides in a given area (Swanston, 1989).

Approximately 167 acres of the Project Area watersheds occur on steep slopes (slopes greater than 72 percent) (Table 3-19). The Forest Plan considers these slopes unsuitable for harvest unless a site-specific risk assessment has been completed. Cliffs, bedrock exposures, landslides, and avalanche tracks are common on these slopes. Planning for the Skipping Cow Timber Sale avoids these areas. Standards and guidelines have been developed for roads on slopes over 67 percent (TLMP, 1997).

The risk of initiating slope failure and degrading site productivity is a concern when harvesting on steep slopes. Slope steepness and soil material were the primary factors used to evaluate slope stability and the likelihood of management-induced slope failure. Units containing significant mapped inclusions of slopes greater than 72 percent will be field verified between Draft EIS and Final EIS preparation. Planned units would be reconfigured to avoid such areas if they are found to exist on the ground. If field reconnaissance shows that high hazard soils do not exist as mapped, the mapping will be modified. In particular, high hazard soils currently mapped in Units 12 and 13 will be checked between preparation of the Draft EIS and Final EIS.

The Forest Service's Mass Movement Index (MMI) rating provides a ranking of the stability of the Project Area. Generally, there is no harvest on soils with a very high MMI. Harvest techniques designed to reduce impacts to soils are

Table 3-19
Geomorphic Indicators in the Watersheds of the Project Area[1/]

Watershed	Area (acres)	Existing Road (miles)	Current Road Density (mi/mi^2)	Acres of MMI Category Soils: MMI[2/] 1 (low)	MMI[2/] 2 (mod.)	MMI[2/] 3 (high)	MMI[2/] 4 (very high)	Slopes > 72 % (acres)	Class III Stream Density mi/mi2)	Road/ Stream Crossings
M. Meter Bight	2,991	1.9	0.4	1,252	1,008	311	420	121	1.4	2
N. Meter Bight	15,486	19.9	0.8	10,354	2,083	2,688	361	1	0.8	43
Nesbitt	10,412	4.7	0.3	7,762	1,631	841	177	1	1.0	19
Vial	3,594	0.0	0.0	2,571	1,022	0	1		1.6	0
Other	9,578	3.1	0.2	7,066	995	1,183	335	44	0.4	3
Total	**42,061**	**29.6**	**0.5**	**29,005**	**6,739**	**5,023**	**1,294**	**167**	**0.9**	**67**

[1/] Some watersheds extend beyond the Project Area. The entire watershed is analyzed in order to determine effects at the watershed level (Figure 3-11).
[2/] MMI = Mass Movement Index

normally applied to soils with a high MMI ranking. Within the watersheds of the Project Area, there are 1,294 acres of very high MMI soils (3.1 percent of the watersheds located wholly or partially within the Project Area), with the greatest percentage concentrated in the Middle Meter Bight watershed. There are 5,023 acres (12 percent) of high MMI soils, mostly located in the North Meter Bight, Mustang Creek, and Nesbitt Creek drainages (Table 3-19).

V-notches and Stream Crossings

Debris avalanches and failure of the steep side slopes of the inner gorges of V-notches can deliver sediment directly to streams. In turn, high gradient streams transport sediment to low gradient fish-bearing waters. Management activities such as timber harvest and road building can result in failure of the steep side slopes of the V-notches. Class III streams in the Forest Service classification system are defined as nonfish-bearing and deeply incised. The amount of Class III streams provides an indicator of the sediment delivery potential in the watersheds of the Project Area. In these watersheds, there are 57 miles of Class III streams, with the Middle Meter Bight and Vial Creek watersheds containing the highest density of these streams (1.4 and 1.6 miles per square mile, respectively) (Table 3-19).

Sediment from roads also enters the aquatic system at stream crossings. These situations can be estimated by totaling the number of stream crossings in the watersheds of the Project Area. There are 67 existing stream crossings in the Project Area watersheds, with the North Meter Bight watershed containing the greatest number (43 crossings) (Table 3-19).

Effects

This section documents the likely effects of the proposed action alternatives on the soils and geomorphic processes in the Project Area in comparison to the No Action Alternative. These include short-term effects resulting from disturbance during road construction and timber harvest as well as long-term, post-disturbance effects. Table 3-20 summarizes the soils and geomorphic indicators for each alternative within the Project Area.

An important component to the effects analysis is road management. The Forest Service is considering two different options (Options A and B) for the long-term management of roads in the Project Area. The two options portend different road network configurations under the four action alternatives.

Option A

Road Management Option A leaves the new system roads open year-round and provides for stormproofing. In this option, culverts and bridges would remain susceptible to plugging and subsequent failure. The number of remaining culverts and crossings at risk within the Project Area varies between 89 for Alternative 4 and 115 for Alternative 3, depending on the number of crossings in each alternative. Stormproofing of roads, which includes placing waterbars and rolling dips on the roadway and outsloping the roads to control runoff, would minimize the amount of sediment eroded from the roads.

Option B

Road Management Option B would close new roads to traffic by placing the roads in storage, or gating and stormproofing the roads (see Issue 2: Road Management). This option would remove most culverts, and therefore, remove the potential for plugging and failure. Where the roads would be storm-proofed rather than put in storage, the effects would be the same as in Option A. Overall, Option B would significantly reduce the potential for failures at road and stream crossings over the long-term. In the short term, small amounts of soil may erode during drainage structure removal. However, the level would be minimized by the implementation of mitigation measures described as part of the Forest Plan Standards and Guidelines (TLMP, 1997).

Soil Productivity

Neither short-term nor long-term soil productivity is expected to be affected by timber harvest. Areas of questionable soil productivity were avoided during project planning. Road construction removes a portion of the forest soils from productivity. Loss of soil productivity would be associated with the construction of all roads. For all alternatives involving the construction of system roads, the

Table 3-20
Comparison of Geomorphic Indicators by Alternative for Watersheds of the Project Area[1/]

Geomorphic Indicators	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Harvest				
Total Acres	1,131	1,110	1,754	906
Slopes>72% (acres)	2	2	2	2
MMI 1 Soils (acres)	81	79	254	47
MMI 2 Soils (acres)	941	941	1,327	800
MMI 3 Soils (acres)	109	90	173	59
MMI 4 Soils (acres)[2/]	0	0	0	0
Class III Streams Miles	1.4	1.4	1.4	1.4
Roads				
New Miles[3/]	13.1	16.2	5.6	14.6
System Miles[4/] – Opt. A	39.2	41.3	33.8	40.3
System Miles[4/] – Opt. B	36.1	36.1	30.7	35.0
Temporary Miles	3.5	4.4	1.4	3.9
Storage Miles (Opt. B)	3.1	3.1	3.1	5.3
Road Density (mi/mi^2) – Opt. A	.60	.63	.51	.61
Road Density (mi/mi^2) – Opt. B	.55	.55	.47	.53
Stream Crossings[5/]				
Number New	53	64	29	58
Total Number - Opt. A	108	119	89	114
Crossings/mi^2 [6/]	1.6	1.8	1.4	1.7
Total Number – Opt. B	70	72	67	71
Crossings/mi^2 [6/]	1.1	1.1	1.0	1.1
MMI 1 Soils (miles)	4.1	6.0	2.5	5.1
MMI 2 Soils (miles)	7.1	8.4	3.0	7.7
MMI 3 Soils (miles)	1.6	1.6	0.0	1.6
MMI 4 Soils (miles)	0.0	0.0	0.0	0.0

1/ Some watersheds extend beyond the Project Area. The entire watershed is analyzed in order to determine effects at the watershed level (Figure 3-11).

2/ Actual occurrence of MMI 4 soils within harvest units was field verified and units modified to avoid MM1 4 soils between DEIS and FEIS.

3/ Both temporary and system roads.

4/ Existing and New Road remaining open (i.e., with culverts remaining in place).

5/ There are 67 existing stream crossings (Alternative 1).

6/ Number excludes crossings removed after harvest. Density of road crossings equals number of crossings divided by square miles of project area (65.7 square miles).

MMI 1 = low

MMI 2 = moderate

MMI 3 = high

MMI 4 = very high

mi/mi^2 = miles per square mile

total loss of soil productivity equals the area covered by new roads. Alternative 3 would result in the greatest loss of soil productivity from roads (27.5 acres) while Alternative 4 would result in the smallest loss (9.5 acres).

Geomorphic Processes—Erosion

While surface erosion is not a pervasive problem on the Tongass National Forest, erosion associated with roads can occur and can result in sediment delivery to streams where roads cross them. These effects are both short-term, associated with road construction activity, and longer-term as erosion of roads and their cut-and-fill slopes occur. Some short-term construction-related erosion is unavoidable and would be mitigated through the application of erosion control measures and BMPs. Long-term erosion of the road prism and associated cut-and-fill slopes would be addressed by post-construction BMPs that include revegetation, road maintenance, stormproofing and road storage.

Relative indicators of both short-term and long-term surface erosion include the miles and density of roads and the number of stream crossings (Table 3-20). Alternative 4, with the fewest miles of roads, would result in the least short-term impact of the four action alternatives. In contrast, Alternative 3, with the most miles of road, would have the greatest construction-related effect. Long-term effects take into account the road decommissioning associated with the management option and alternative. Under Option A, Alternative 3 would have the highest road and crossing densities (0.63 mile per square mile, 1.8 crossings per square mile) while Alternative 4 would have the lowest (0.51 mile per square mile, 1.4 crossings per square mile). Under Option B, all of the action alternatives would have approximately the same road density (0.47 mile per square mile, 1.1 crossings per square mile).

Mass Wasting and Harvest on Steep Slopes

Recognizing that mass wasting is a natural process in Southeast Alaska, the land management direction for the Tongass National Forest is to avoid activities that accelerate mass wasting. This primarily involves avoiding activities on those portions of the landscape recognized as prone to failure. These areas have been identified through on-the-ground and aerial photography review of soil, topographic, and vegetation conditions that indicate actual or potential slope instability. Construction of roads and harvest on areas of very high mass movement potential are avoided entirely.

Table 3-20 displays the amount of very high and high mass movement potential along the proposed roads and harvest units for the four action alternatives. There are about 2 acres of land in the proposed harvest units in all alternatives that contain slopes greater than 72 percent. Alternative 4 contains 152 acres of high mass movement (MMI 3) potential in proposed harvest units (less than 1 percent of the total acres and less than 9 percent of the harvest acres), while Alternative 5 has the least with 57 acres.

Alternatives 2, 3, and 5 have 1.6 miles of road across lands identified as high mass movement potential. Alternative 4 has none. Roads in all of the alternatives are generally on slopes less than 67 percent. Where short sections of steep slopes were unavoidable, site-specific BMPs, including full bench

construction and end hauling of waste materials, are required (see Road Cards in Appendix C). Site-specific BMPs are developed following the requirements of the Forest Plan Standards and Guidelines (TLMP, 1997). These BMPs are designed to minimize the negative effects of road building and use. From the perspective of road-related risk, Alternatives 2, 3, and 5 have the highest risk of mass wasting because they include the highest amount of potentially unstable soils (1.6 miles each) along road routes, while Alternative 4 has the lowest with none. Relative to other alternatives, Alternative 4 would have the lowest risk of mass wasting because roads would not cross any MMI 3 or MMI 4 soils and the majority of the harvest area would retain many live trees to maintain root strength in harvest units. In contrast, Alternative 3 would have the highest risk.

V-notches and Stream Crossings

Harvest can induce slumping in the inner gorges of V-notches (steep streams deeply incised into the bedrock). Sediment delivery to streams at road crossings can introduce fine sediment directly into the aquatic environment. While all action alternatives have 1.4 miles of Class III streams within proposed harvest units, the number of planned road/stream crossings differ among the action alternatives (Table 3-20). The potential for management-induced failure along V-notches is minimized by the application of harvest buffers to at least the topographic slope break above Class III streams and by harvest systems that yard the timber away from streams.

Under Road Management Option A, Alternative 3 has the greatest number of stream crossings (119), indicating the greatest risk of introducing sediment to the aquatic environment, while Alternative 4 has the fewest stream crossings (89). The number of crossings are reduced under Road Management Option B. All the action alternatives would have about the same number (67 to 72). In addition to the BMPs applied to roads in general, BMPs specific to stream crossings, such as Bridge and Culvert Design and Installation (14.17) and Control of In-channel Operations (14.14), ensure that sediment delivery at stream crossings is minimized during construction and that crossings are designed to pass extreme flow events that could plug culverts and result in failure of the crossings. Regardless, the greater the number of crossings the greater the risk that sediment delivery to streams will be accelerated.

Summary

When considering long- and short-term negative effects to the soil resource from both harvest-related and road-related activities, Alternative 4 would have the lowest level of risk compared the other action alternatives. Alternative 3 would have the highest level of risk, but not substantially above Alternatives 2 and 5. The major factors contributing to the lower risk of Alternative 4 are the lower level of road building and the silvicultural prescription that maintains relatively high root strength in the majority of harvested areas. The lower level of road building also contributes to a lower stream crossing density.

Cumulative Effects

Geology (Karst and Mineral Resources)

Due to the absence of carbonate strata on Zarembo Island, there are no karst resources and consequently no cumulative effects on karst resources. While mining is not part of any alternative for the Skipping Cow Timber Sale, quarries for road material would be needed. There appears to be ample quarry rock available to meet the foreseeable demand. Access provided by new road development associated with the proposed action alternatives could encourage mineral prospecting on Zarembo Island. However, no specific mineralized zones are known and the prospecting potential appears remote.

Soils and Geomorphology

The extension of the road and harvest network on Zarembo Island by the action alternatives adds to the existing disturbance. Currently, no additional entries are expected within the Project Area during this planning cycle. This discussion of cumulative effects considers both previous activities and the proposed action alternatives.

Summing the existing and proposed miles of road by action alternative displays the cumulative disturbance in terms of total miles and road densities. Following storage of roads proposed under Option B, the overall road density in the Project Area would decline to 0.47 mile per square mile under all alternatives. Without storage (Option A), the highest road density would increase to 0.63 mile per square mile. Regardless of alternative or road management option, these densities would be relatively moderate compared to other managed areas of the Forest. Cumulative stream crossings are also displayed in Table 3-20. These effects are additive and mirror the effects discussed above.

The Baht Timber Sale (estimated at 10 MMBF) is planned for the northern portion of Zarembo Island in the year 2002. This sale would not add to the geology, soils, and geomorphology cumulative effects in the Project Area because the Baht Timber Sale is wholly outside of the Skipping Cow Project Area in different watersheds. None of the alternatives propose new harvest that would increase total harvested acreage to more than 12.3 percent of a watershed. This level would be substantially below the 20 percent "rule-of-thumb" that triggers implementation of a detailed watershed analysis. Consequently, the soils and geomorphic properties within the Project Area are not considered to be at high risk of cumulative negative effects as a result of implementing any of the action alternatives.

Fisheries and Watersheds

Introduction

The State of Alaska has designated one of several beneficial uses of fresh and marine waters as the growth and propagation of fish and shellfish (18 AAC 70). By law, the Forest Service must maintain these uses, protect riparian habitat, and prevent detrimental changes in water temperature, water chemistry, stream channel stability, and sediment loads that adversely affect these uses. Streams on Zarembo Island provide spawning and rearing habitats for coho (*Oncorhynchus kisutch*), chum (*O. keta*), and pink (*O. gorbuscha*) salmon, steelhead (*O. mykiss*), cutthroat trout (*O. clarki*), and Dolly Varden char (*Salvelinus malma*). Within this project's locale, pink salmon, coho salmon, and Dolly Varden char are considered MIS due to their commercial and recreational importance, their reliance on freshwater habitat for spawning and egg incubation, and their need for a year or more of pre-smolt rearing in freshwater (coho and Dolly Varden).

The maintenance of a strong and productive fishery is important to the area's economy and for providing recreational and subsistence opportunities to neighboring communities. In addition, the presence of salmonids can be used as an indication of clean, cool water supplies. These species are the dominant component to the freshwater fish biomass in the region, and consequently play an important role in the biodiversity of the forest ecosystem as a whole. Sustaining the production of salmon and trout is partially dependent upon habitat protection, and is a prominent objective of the Forest Plan Standards and Guidelines (TLMP, 1997; FSH 2509.22; USDA Forest Service, 1996) and the TTRA provisions that are applied to timber harvest activities and road construction in the Tongass National Forest.

The data and analyses presented in the Fisheries and Watersheds Resource Report (USDA Forest Service, 1998g) are intended to provide a detailed description of fish resources and habitat conditions within the Project Area on Zarembo Island and potential impacts associated with harvest activities that may occur under the proposed alternatives. This information is summarized below.

Streams within the Project Area (Figure 3-11) have been categorized according to the types of fish present or potentially present. These are described under Aquatic Habitat Management Unit in the Glossary.

Stream channels within the Project Area have also been classified by process groups using the Alaska Region Channel Type Classification System described under the Riparian Areas subsection. Large woody debris (LWD) is an important biological feature that can affect the occurrence and morphology of pools and gravel deposits, sediment storage and routing, bank stability, and overall channel complexity.

Fisheries

Watersheds wholly or partly within the Project Area contain approximately 52.9 miles of fish-bearing streams. The four major watersheds are: Nesbitt Creek, Vial Creek, Middle Meter Bight Creek, and North Meter Bight, which contains the Mustang Creek subwatershed (Figure 3-11). A substantial amount of fish-bearing streams (12.6 miles) are also present in five small unnamed streams that drain the southern portion of the island in addition to Nesbitt Creek and Vial Creek. Cutthroat trout and Dolly Varden char are widely distributed throughout the three VCUs (457, 458, and 459) partly in the Project Area.

Fish migration barriers are shown in Figure 3-11.

Effects

Road construction has a higher potential for affecting fish habitat in the Project Area than timber harvest. Both short-term and long-term negative effects could result from new road construction and use (Furniss et al., 1991). The primary negative effects could include migration barriers and the production of fine and coarse sediments which may reduce egg to fry survival and fish habitat quality and quantity. Sediment-related effects are discussed in the Watersheds section.

Each alternative provides a high level of fish habitat protection during timber harvest through mandatory mitigation measures and project-specific design considerations. Mitigation measures were developed as part of the Anadromous Fish Habitat Assessment (USDA Forest Service, 1995) and are implemented forest-wide through Forest Plan Riparian Standards and Guidelines (TLMP, 1997). The measures are designed to avoid, rectify, reduce, or eliminate potential adverse environmental impacts of forest management activities. An important component to the mitigation measures are riparian no-harvest buffers. All alternatives are consistent with the Forest Plan. None of the alternatives propose harvest adjacent to fish-bearing streams.

Under one proposed scenario (Option A), public motorized access after completion of the sale would not be restricted. Roads would be maintained in a drivable condition but would be "stormproofed" to decrease the risk of culvert failure during storms. Stormproofing measures include the construction of dips in the road surface to safeguard cross drains. There would be some risk that stormproofing measures would be negatively affected by vehicle road travel on ungated roads, but periodic inspections and maintenance by the Forest Service should largely remove this risk. Maintenance crews would also perform hand work, such as culvert cleaning and seeding, as necessary.

Snow Pass
Old Growth Reserve
Nesbitt Ridge
Mustang Lake
Sub-Watershed
North Meter Bight
Watershed
North Meter Bight Creek
Mustang
East Fork Nesbitt Creek
Middle Meter Bight Creek
Nesbitt Creek
Watershed
West Fork Nesbitt Creek
Nesbitt Creek
Snail Creek
Lake
Skipping Cow
Lake
Vial Creek
Watershed
East Kettle Creek
Vial Creek
Middle Meter Bight
Watershed
South Meter Bight Creek
Round Point
Old Growth Reserve
LEGEND
Streams
Class 1
Class 2
Class 3
Class 4
Existing Roads
Watershed Boundary
Sub-Watershed Boundary
Project Area
Fish Barriers
Existing Harvest Units
Saltwater
Lakes
Old Growth Reserves
Skipping Cow
Timber Sale EIS
Figure 3-11
Streams and Watersheds
May 16, 2000
May 16, 2000 strmws.ps

Under the second proposed scenario (Option B), public motorized access to some road segments would be restricted after completion of the sale through the use of physical barriers such as gates and stormproofing measures or road storage would be implemented during sale closure to decrease the risk of drainage structure failure during storm events. Roads placed in storage would have large boulders or other structures placed at the road entrance to prevent access. Stream crossing structures would be removed or bypassed and drainage patterns across roads would be re-established. The primary difference between storage and decommissioning is that roads under storage could be reopened in the future.

Under all alternatives, Option A has a higher risk of road-related mass wasting events and culvert failure that could negatively affect fish populations compared to Option B. Removal of drainage structures under Option B greatly reduces the long-term risk of road-related negative effects to fish. In contrast, short-term, low magnitude effects from soil disturbance in stream beds can occur during removal of the drainage structures. However, these effects are minimized by the use of BMPs outlined in the Forest Plan Standards and Guidelines. In general, the overall risk of negative effects to fish are reduced when drainage structures are removed compared to the long-term risk of a major failure to an open system road. Post-sale road recommendations (Thompson, 1999) are available in the planning file. This document contains site-specific watershed and fisheries guidance for stormproofing and storing each road used for the Skipping Cow Timber sale. Under all alternatives, temporary spur roads within the Project Area would be put to bed following harvest.

Tables 3-21 and 3-22 shows fish-bearing and nonfish-bearing stream crossings by watershed in each alternative. Table 3-23 shows the number of bridges and large culverts (greater than or equal to 48 inches) proposed within each alternative. Bridges are proposed for one fish-bearing stream and for up to four other locations that have geomorphic conditions that warrant a bridge. Stream crossings at fish-bearing streams have the potential for becoming migration barriers if culverts become perched or blocked from debris, or if water velocity is too high for a fish to swim against.

In summary, direct impacts associated with harvest adjacent to fish streams have been avoided. Indirect impacts associated with watershed harvest are addressed below. Road construction (especially drainage structure installation), road use, and road maintenance would inevitably introduce sediment to fish streams in any alternative. Alternatives constructing more road and more fish stream crossings would have more direct impacts. Therefore, Alternative 3 has the highest level of risk and Alternative 4 has the lowest. Overall impact under any alternative is expected to be minimized based on the BMPs and standards and guidelines to be followed during implementation of the harvest.

Table 3-21
Stream Crossing Structures by All Watersheds Wholly and Partly within the Project Area (Option A)

Watershed Name	Alternative 1 Existing System Roads	Alternative 2 New Roads	Alternative 2 Total System Roads[1/]	Alternative 2 Total Storm-Proof[2/]	Alternative 3 New Roads	Alternative 3 Total System Roads[1/]	Alternative 3 Total Storm-Proof[2/]	Alternative 4 New Roads	Alternative 4 Total System Roads[1/]	Alternative 4 Total Storm-Proof[2/]	Alternative 5 New Roads	Alternative 5 Total System Roads[1/]	Alternative 5 Total Storm-Proof[2/]
Fish-bearing Streams (Class I and II)													
N. Meter Bight	33	0	33	2	0	33	2	0	33	2	0	33	2
M. Meter Bight	2	0	2	0	0	2	0	0	2	0	0	2	0
Vial Creek	0	0	0	0	0	0	0	0	0	0	0	0	0
Nesbitt Creek	6	0	6	6	0	6	6	0	6	6	0	6	6
Others	2	0	2	0	0	2	0	0	2	0	0	2	0
Total Fishbearing	**43**	**0**	**43**	**8**	**0**	**43**	**8**	**0**	**43**	**8**	**0**	**43**	**8**
Nonfish-bearing Streams (Class III and IV)													
N. Meter Bight	10	13	20	10	13	20	10	0	10	0	13	20	10
M. Meter Bight	0	1	1	1	10	10	10	1	1	1	10	10	10
Vial Creek	0	22	15	15	24	17	17	22	15	15	24	17	10
Nesbitt Creek	13	17	28	17	17	28	17	6	19	17	11	23	17
Others	1	0	1	0	0	1	0	0	1	0	0	1	0
Total Non-fishbearing	**24**	**53**	**65**	**43**	**64**	**76**	**54**	**29**	**46**	**33**	**58**	**71**	**47**
Total	**67**	**53**	**108**	**51**	**64**	**119**	**62**	**29**	**89**	**41**	**58**	**114**	**55**

1/ Number of stream crossings remaining after closure of all temporary roads. See Chapter 2 for descriptions of storage.

2/ Road segments with stormproofing would have berms installed to limit access by motorized vehicles. Additional minor crossings may also be stormproofed.

Table 3-22
Stream Crossing Structures by All Watersheds Wholly and Partly within the Project Area (Option B)

	Alternative 1	Alternative 2			Alternative 3			Alternative 4			Alternative 5		
Watershed Name	Existing System Roads	New Roads	Total System Roads[1/]	Total Storm-Proof[2/]	New Roads	Total System Roads[1/]	Total Storm-Proof[2/]	New Roads	Total System Roads[1/]	Total Storm-Proof[2/]	New Roads	Total System Roads[1/]	Total Storm-Proof[2/]
Fish-bearing Streams (Class I and II)													
N. Meter Bight	33	0	33	2	0	33	2	0	33	2	0	33	2
M. Meter Bight	2	0	2	0	0	2	0	0	2	0	0	2	0
Vial Creek	0	0	0	0	0	0	0	0	0	0	0	0	0
Nesbitt Creek	6	0	6	6	0	6	6	0	6	6	0	6	6
Others	2	0	2	0	0	2	0	0	2	0	0	2	0
Total Fishbearing	**43**	**0**	**43**	**8**	**0**	**43**	**8**	**0**	**43**	**8**	**0**	**43**	**8**
Nonfish-bearing Streams (Class III and IV)													
N. Meter Bight	10	11	10	0	11	10	0	0	10	0	11	10	0
M. Meter Bight	0	1	1	1	10	0	0	1	0	0	10	0	0
Vial Creek	0	22	0	0	24	0	0	22	0	0	24	0	0
Nesbitt Creek	13	17	18	5	17	18	5	6	18	5	11	18	5
Others	1	0	1	0	0	1	0	0	1	0	0	1	0
Total Non-fishbearing	**24**	**51**	**30**	**6**	**61**	**29**	**5**	**29**	**24**	**5**	**55**	**28**	**5**
Total	**67**	**51**	**70**	**14**	**61**	**72**	**13**	**29**	**67**	**24**	**55**	**71**	**13**

[1/] Number of stream crossings remaining after storage of system roads and closure of all temporary roads. See Chapter 2 for descriptions of storage.

[2/] Road segments with stormproofing would have berms installed to limit access by motorized vehicles. Additional minor crossings may also be stormproofed.

Table 3-23

Proposed Bridges and Culverts (≥ 48-inch-diameter) by Watershed and Alternative

	Alternative 2		Alternative 3		Alternative 4		Alternative 5	
Watershed	**Bridge**	**≥48 in.**	**Bridge**	**≥48 in.**	**Bridge**	**≥48 in.**	**Bridge**	**≥48 in.**
North Meter Bight	0	5	0	5	0	0	0	5
Middle Meter Bight	1	0	3	4	1	0	3	4
Nesbitt Creek	0	5	0	5	0	0	0	2
Vial Creek	1	5	1	5	0	5	1	5
Total	**2**	**15**	**4**	**14**	**1**	**5**	**4**	**16**

The information in this table is derived from the information in Tables 3-21 and 3-22.

Marine Water (Affected Environment)

Deep Bay and Roosevelt Harbor on the northeast side of Zarembo Island, and St. John Harbor on the northwest side of Zarembo Island are the only marine waters likely to be affected by the Skipping Cow Timber Sale. Deep Bay and Roosevelt Harbor are characterized as narrow coves with relatively steep, rocky shorelines. Deep Bay has a small anadromous stream at its head, which contributes to a small estuarine grass and mud flat. Pink, chum, and coho salmon have been observed in this stream. Roosevelt Harbor has no notable streams; its estuarine environment is very limited. St. John, by comparison, is a relatively large bay with islands and extensive tidal flats and a gently sloped shoreline. St. John Creek, one of the most productive anadromous fish streams on Zarembo Island, flows into the southern side of the bay, about two-thirds of a mile from the log transfer facility (LTF). Several other (though much smaller) anadromous fish streams flow into the east side of the bay. St. John Harbor is Zarembo Island's largest estuary. Marine mammals (seals, sea lions, whales) have been observed in all three places.

Deep Bay, Roosevelt Harbor, and St. John Harbor provide protected and popular anchorages for commercial fishing vessels, as well as recreational and subsistence visitors to Zarembo Island.

The south shore of Deep Bay has been developed as an LTF with an access road located near the shoreline and stream. The log crib bulkhead LTF was constructed in 1971 and reconstructed with a steel pile supported concrete deck in 1984. In 1994 a non-point discharge elimination system (NPDES) was constructed to incorporate storm water runoff features to control sediment. Visual inspections indicate that these features are effective in detaining sediment from the LTF area and preventing sediment entry into marine waters. However, under heavy traffic conditions, the access road does not have adequate drainage features to prevent sediment entry into the anadromous stream and estuary area. Muddy runoff from the road has been noted as a problem to be addressed during reconstruction work included in the Skipping Cow Timber Sale. Reconstruction work will include establishment of interception ditches, culverts, and placement of rock surfacing on the road.

The head of Roosevelt Harbor has been developed as a log crib equipment bulkhead and dock facility. This area, in conjunction with an old camp site and the access road between the dock and the camp site also has inadequate drainage features to prevent sediment entry into marine waters. This problem will also be addressed during reconstruction of the bulkhead prior to the Skipping Cow Timber Sale. A preliminary design for reconstruction of the equipment bulkhead and associated storm water runoff interception features will be included with an application to the Corps for authorization of the work.

In 1970, a rock fill/log bulkhead LTF and access road were developed on the southeast side of St. John Harbor. The LTF was reconstructed as a concrete

bulkhead in 1985. A concrete ramp about 600 feet southwest of the bulkhead was designed for small sales. There is a dock facility next to the bulkhead.

There is no available site-specific information on the marine flora or fauna of Deep Bay, Roosevelt Harbor, or St. John Harbor. In 1999, an independent diver was contracted to survey Deep Bay for bark deposition. Transects of 50, 75, and 100 meters from the LTF were monitored. Bark depths ranged from 0 to 6 centimeters. The most area covered was 20 percent of a 12-square-meter plot, associated with the 6-centimeter bark depth. The findings indicated that there was very little bark accumulation in Deep Bay, and the bark depths recorded were within the thresholds established by the LTF permits.

In 1997, a similar survey was conducted at St. John Harbor. Five transects of about 100 meters each were monitored. Bark depths ranged from 0 to 10 centimeters. The most area covered was 80 percent of a 2-square-meter plot, associated with the 10-centimeter bark depth. Of the 49 sites measured (about 10 per transect), 41 were bark free and 8 had bark depths ranging from 2 to 10 centimeters. Only one site neared thresholds (10 centimeter depth) established by LTF permits.

No log transfer has occurred at these sites since the bark deposition surveys were completed.

Effects

The accumulation of bark and other woody debris on the ocean floor associated with the transfer and storage of logs can impact marine habitats by smothering organisms or creating unfavorable chemical conditions. Apparently, both Deep Bay and St. John Harbor receive enough tidal current to flush bark from the bottom out into deeper waters and the effects mentioned above are not apparent at either site.

The initial tideland fills associated with developments in all three areas probably destroyed some marine habitat and displace organisms. Improvements proposed for the Skipping Cow Timber Sale will not expand these fills, so no additional impacts of this type are anticipated.

The existing Deep Bay LTF bulkhead can be used for direct barge transfer with conventional log loaders but only for a short window of time during high tide. This method was proposed for the upcoming Deer Run Salvage Sale because of the relative small size of the sale (120 MBF). There is very limited space available to deck logs on the LTF site. A sale the size of the Skipping Cow Timber Sale would require the use of a large crane to load logs directly on a barge or to the water for raft construction. From the late 1960s to 1984, approximately 125 million board feet of timber have been transferred from the site, directly to the water by A-frame or large crane and rafted. Since 1984, approximately 25 million board feet of timber has been transferred from the site, with approximately half being placed directly into the water by crane or floating

LTF and half loaded onto barges. It is likely for the Skipping Cow Timber Sale that log transfer would be accomplished by use of a crane or a floating LTF directly to the water. However, the timber purchaser may elect use of a barge.

About 264 million board feet of timber have been transferred from the St. John LTF directly to the water by large crane or to barges. It is likely for Skipping Cow Timber Sale that log transfer would be accomplished by use of a crane or a barge, but a floating LTF could also be used at St. John. Again, the timber purchaser may elect any of these methods.

All Skipping Cow alternatives would use either the Deep Bay LTF or the St. John LTF, and it may be possible that the purchaser would choose to use both LTFs. The total Skipping Cow Timber Sale volume passing through LTFs ranges from 19.1 to 24.4 million board feet.

Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act of 1996 requires consultation with the NMFS on activities that may affect Essential Fish Habitat, defined as "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity." The Act promotes the protection of these habitats through review, assessment, and mitigation of activities that may adversely affect these habitats. This EIS satisfies the consultation requirements by providing a description and assessment of Essential Fish Habitat in the Project Area, a description of the Skipping Cow Timber Sale and its potential impacts on these habitats, and a description of the mitigation measures that will be implemented to protect these habitats.

Essential Fish Habitat includes all freshwater streams accessible to anadromous fish, marine waters, and intertidal habitats. For the Skipping Cow Timber Sale project, this would include all Class I streams, the marine waters and intertidal habitats at the project area shoreline, and the marine waters and intertidal habitats associated with Deep Bay and Roosevelt Harbor, which serve as log and equipment transfer sites for the project.

The Skipping Cow Timber Sale is unlikely to adversely affect Essential Fish Habitat for the following reasons: (1) proposed new roads cross no Class I streams; (2) all harvest units adjacent to Class I streams employ no-harvest buffers at least 100 feet wide and generally wider according to Forest Plan Standards and Guidelines; (3) proposed road and facility reconditioning will improve erosion and sediment control in the vicinity of Deep Bay and Roosevelt Harbor. The BMPs described in the unit cards and road cards (Appendices B and C) provide assurance of water quality and aquatic habitat protection for all freshwater streams and marine waters affected by the project.

Riparian Areas

Floodplains moderate flood flow, recharge stream low flow, and provide deposition areas for sediment. The decay of salmon carcasses deposited on floodplains during fall peak flows is an important part of the nutrient cycling process. Riparian areas, including floodplains, contain vegetation that provides shade trees that are future sources of large wood for fish habitat and channel stability, and litter fall which is a nutrient and food source for fish. Intact riparian areas also intercept sediment and provide critical habitat for wildlife species feeding on fish and other aquatic organisms.

Table 3-24 shows the distribution of eight stream process groups in the Project Area by major watershed. No glacial outwash channel types are present in the Project Area. The values shown are for Class I, II, and III stream miles. These process groups serve as the basis for delineating riparian management areas or no-harvest buffers (TLMP FEIS, 1997).

The process groups reflect physical differences in stream channels and stream processes (USDA Forest Service, 1992). The system used by the Forest Service in Alaska includes nine basic fluvial process groups that describe the interrelationship between watershed runoff, landform relief, geology, and glacial or tidal influences on fluvial erosion and deposition processes. Fluvial processes are important to the aquatic ecosystem because they represent the physical mechanisms that create fish habitat in fish-bearing streams, and elements in nonfish-bearing streams that subsequently affect fish habitat downstream.

Table 3-24
Distribution of Stream Process Groups (Stream Miles by Watershed)

Process Group	Nesbitt	Vial	Middle Meter Bight	North Meter Bight	All Others	Total Project Area
Estuarine	0.1	0.0	0.0	0.0	0.0	0.1
Floodplain	3.2	0.2	0.2	0.8	1.1	5.5
Palustrine	2.7	0.0	0.2	0.4	1.0	4.2
Alluvial Fan	1.1	0.7	0.4	0.5	0.0	2.7
Moderate Gradient Mixed Control	5.4	0.9	1.5	0.6	3.8	12.3
Moderate Gradient Contained	5.6	2.7	0.0	1.0	1.5	10.8
High Gradient Contained	25.4	14.7	7.0	10.9	9.2	67.2
Large Contained	1.8	1.0	0.0	0.0	0.0	2.8
Total	**45.3**	**20.2**	**9.3**	**14.2**	**16.6**	**105.5**

The nine process groups are:

- Estuarine
- Palustrine
- Floodplain
- Glacial outwash
- Alluvial fan
- Large contained
- Moderate gradient mixed control
- Moderate gradient contained
- High gradient contained

Floodplain (FP), estuarine (ES), and palustrine (PA) streams represent the most important and sensitive riparian areas in the Project Area. These low gradient streams contain the highest quality fish habitat and are the most sensitive to sediment deposition. Alluvial fan (AF), moderate gradient mixed control (MM), and moderate gradient contained (MC) streams are slightly steeper and alternately receive and transport sediment. They usually contain fish habitat primarily for resident trout. High gradient contained (HC) streams are headwater streams, have limited fish habitat (usually Class II, if any), and function as conduits for sediment and debris delivery to downstream reaches.

Class IV streams are small, ephemeral or intermittent streams with no fish habitat and little to no associated floodplain. Under the Forest Plan Standards and Guidelines (TLMP, 1997), timber harvest can occur along Class IV streams, but site-specific restrictions may need to be implemented to protect stream channel integrity.

Effects

Direct impacts to floodplains and riparian areas may result from vegetation and ground disturbance in these areas. Each alternative provides a high level of riparian and floodplain protection through both mandatory mitigation measures and project-specific design considerations. Units were verified by field crews and, in many cases, unit boundaries and road locations were changed to protect riparian resources.

None of the action alternatives propose modifications to the riparian standards and guidelines described in the Forest Plan (TLMP, 1997). The widths of the riparian management areas (no-harvest buffers) vary by process group. Some buffers are 120 feet wide (MM streams) or 140 feet wide (AF streams). Large V-notches (Class III HC streams) have complete sideslope protection. Unit boundaries would begin at the edge of the notch or beyond. Buffers on small

Class III streams completely protect the stream sideslope. The unit cards and maps in Appendix B display the riparian management areas.

Windthrow is a major concern in the Project Area. Alternative 5 was designed especially with windthrow risk as a consideration. Approximately 250 years ago, an extremely severe windstorm blew down hundreds of acres of timber in the Project Area. Although unit design will not eliminate all windthrow, especially if rare storm events occur, the importance of windthrow in the area was considered when designing stream buffers. In many cases, buffer widths would be further adjusted during final layout of unit boundaries to take advantage of topographic features that would reduce the risk of windthrow. Also, widths would be increased to provide reasonable assurance of windfirmness where needed.

Watersheds

The Vial Creek and Middle Meter Bight watersheds in the Project Area are relatively small and are dominated by steep mountain slopes and narrow valleys. The Nesbitt Creek watershed and Mustang Creek subwatershed (tributary to North Meter Bight Creek) are also relatively small, but have a low relief compared to the Vial Creek and Middle Meter Bight watersheds. Nevertheless, when considering all watersheds partly or wholly within the Project Area, over 75 percent of the stream reaches are in the high gradient contained process group (Table 3-24). The lower valleys widen as the stream gradients decline, eventually draining to the southern and eastern sides of Zarembo Island. These lower stream reaches are the principle spawning areas for pink and chum salmon.

A simple watershed sensitivity analysis was conducted based on GIS soils, streams, and slope data for watersheds greater than 500 acres (small watersheds tend to have over-estimated sensitivity in this type of analysis). A digital elevation model was used to calculate slope classes as an index of areas conducive to transporting sediments if mass wasting occurs.

Stream density reflects a watershed's ability to transport sediment through the stream network. High stream densities provide efficient transport. For the purposes of this analysis, only Class I, II, and III streams were included because Class IV stream miles are substantially underestimated without intensive field verification, whereas larger streams are reasonably mapped from photo interpretation. Field verification has focused on proposed harvest units within the Project Area; therefore, the Class IV drainage network has not been mapped in its entirety throughout the Project Area.

Stream process groups provide an indication of transport and depositional reaches. Floodplain, palustrine, and estuarine process groups are considered depositional streams while the high gradient process group are considered sediment transport reaches.

The analysis suggests that the Middle Meter Bight watershed is the most geomorphically sensitive watershed in the Project Area (Table 3-25). The relatively large proportion of steep slopes and moderately high stream density suggests that the watershed contains significant natural sediment source areas and an efficient distribution system. In addition, over half of the stream lengths in the Middle Meter Bight watershed are Class I. Many of the Class I reaches have a moderate gradient and consequently alternate between the transport and deposition of sediment. This suggests that most of the Class I reaches would be sensitive to sediment-related impacts in the short-term, but would eventually recover in the long-term.

Table 3-25
Watershed Sensitivity

Watershed	Area (acres)	Percent Acres > 55% Slope	Percent Acres > 75% Slope	Stream Density (mi/mi^2)1/	High Transport Stream Miles	Depositional Stream Miles
Nesbitt Creek	10,412	1.0	0.0	2.6	30.3	6.7
Vial Creek	3,594	0.3	0.0	2.9	14.0	0.7
N. Meter Bight	15,486	1.0	0.0	0.5	9.2	1.5
M. Meter Bight	2,992	19.8	2.9	1.8	6.0	0.6

1/ mi/mi^2 = miles per square mile

Timber harvesting and road building has occurred previously in the Project Area. Four harvest entries have occurred within watersheds included in the project boundary. Most harvesting prior to 1980 occurred in small watersheds located along the shoreline and did not require road building, but ground-based equipment (tractors and skidtrails) was often used for yarding timber. A road was built during the early 1980s and 517 acres were clearcut in the Nesbitt Creek and Mustang Creek watersheds. Two additional units, totaling 65 acres, were harvested in the Mustang Creek drainage during 1988. A total of 29.6 miles of road have been built in the watersheds affected by the project. Most of the road building has occurred in the North Meter Bight and Nesbitt Creek watersheds. Road densities are relatively low for all the watersheds with the North Meter Bight watershed having the highest density at 0.8 mile per square mile (Tables 3-21 and 3-22).

Effects

Environmental effects to watersheds from the action alternatives were analyzed by comparing the relative amounts of clearcut, partial-cut, cable yarding, helicopter yarding, road miles, and stream crossings within each watershed. Under the analysis, it was assumed:

- Partial-cutting would have lower risk than clearcutting
- Helicopter yarding would have a lower risk than cable yarding
- Fewer road miles would have a lower risk
- Fewer stream crossings would have a lower risk

The short-term negative effects of road building occur primarily from soil disturbance that gradually diminishes as disturbed areas revegetate and from culvert and bridge building which diminishes after construction is complete. Both short-term and long-term negative effects are minimized by the implementation of BMPs, which are outlined in the Forests Service's Soil and Water Conservation Handbook (FSH 2509.22). Standard BMPs include timing restrictions, drainage structures, and reseeding of disturbed areas. These and other BMPs are included on the road cards in Appendix C.

The following sections compare the risk of negative effects from the alternatives for each major watershed, and then discuss the relative risk for the entire Project Area. In all cases, Option B has a lower long-term risk for negative impacts to watersheds than Option A.

Middle Meter Bight

Of the four action alternatives, Alternatives 2 and 4 would provide the lowest risk of negative effects to the Middle Meter Bight watershed because the fewest miles of new road would be built (0.7 mile) (Table 3-26) and a larger proportion of the harvested acreage would utilize helicopter yarding. The major difference between Alternatives 2 and 4 is the type of harvest in the cable yarded units. Alternative 2 would harvest 70 to 80 percent of the trees over 9 inches DBH while Alternative 4 would remove all timber except residual trees. Fewer acres would be harvested under Alternatives 3 and 5 compared to Alternatives 2 and 4, but all of it would be cable yarded, which increases the level of soil disturbance. Consequently, Alternatives 3 and 5 are considered riskier from a harvest perspective.

More importantly, under Option A the Middle Meter Bight watershed would have 0.7 mile of new road built under Alternatives 2 and 4, and 2.8 miles of new road built under Alternatives 3 and 5 (Table 3-26). However, after road storage (Option B), 1.8 miles of open system road would be present under all alternatives. Consequently, the short-term risk of negative effects from roads is highest for Alternatives 3 and 5 and lowest for Alternatives 2 and 4. In contrast, the long-term risks are similar for all alternatives. Consequently, the overall risk of negative effects from timber harvest and related activities would be lowest for Alternatives 2 and 4 and highest for Alternatives 3 and 5.

Table 3-26

Existing and Proposed Road Miles by Alternative for Watersheds Affected by the Project

	Alt. 1	Alternative 2			Alternative 3			Alternative 4			Alternative 5		
Watershed	Existing System Roads	New Roads[1/]	Total System Roads[2/]	Total Storm-Proof[3/]	New Roads[1/]	Total System Roads[2/]	Total Storm-Proof[3/]	New Roads[1/]	Total System Roads[2/]	Total Storm-Proof[3/]	New Roads[1/]	Total System Roads[2/]	Total Storm-Proof[3/]
Option A													
N. Meter Bight	19.9	2.5	21.5	3.2	2.5	21.5	3.2	0.0	19.9	1.6	2.5	21.5	3.2
M. Meter Bight	1.9	0.7	2.2	0.3	2.8	3.7	1.8	0.7	2.2	0.3	2.8	3.7	1.8
Vial Creek	0.0	3.9	2.9	2.9	4.8	3.5	3.5	3.9	2.9	2.9	4.8	3.6	3.6
Nesbitt Creek	4.7	6.0	9.5	9.5	6.0	9.5	9.5	1.0	5.7	5.7	4.5	8.4	8.4
Others	3.1	0.0	3.1	0.0	0.0	3.1	0.0	0.0	3.1	0.0	0.0	3.1	0.0
Total	**29.6**	**13.1**	**39.2**	**15.9**	**16.1**	**41.3**	**18.0**	**5.6**	**33.8**	**10.5**	**14.6**	**40.3**	**17.0**
Option B													
N. Meter Bight	19.9	2.5	21.5	3.2	2.5	21.5	1.6	0.0	19.9	1.6	2.5	21.5	3.2
M. Meter Bight	1.9	0.7	1.8	0.0	2.8	1.8	0.0	0.7	1.8	0.0	2.8	1.8	0.0
Vial Creek	0.0	3.9	0.2	0.1	4.8	0.8	0.1	3.9	0.2	0.1	4.8	0.2	0.1
Nesbitt Creek	4.7	6.0	9.5	9.5	6.0	9.5	9.5	1.0	5.7	5.7	4.5	8.4	8.4
Others	3.1	0.0	3.1	0.0	0.0	3.1	0.0	0.0	3.1	0.0	0.0	3.1	0.0
Total	**29.6**	**13.1**	**36.1**	**12.8**	**16.1**	**36.1**	**12.8**	**5.6**	**30.7**	**7.4**	**14.6**	**35.0**	**11.7**

1/ New roads include both new system roads and new temporary roads.

2/ Miles of road remaining after storage of selected roads and closure of all temporary roads.

3/ Road segments with stormproofing will have berms installed to limit access by motorized vehicles. See Chapter 2 for description of stormproofing activities.

Note: Totals may differ between tables due to rounding.

North Meter Bight

Of the four action alternatives, Alternative 4 would provide the lowest risk of negative effects to the North Meter Bight watershed because no new roads would be built and all of the harvested acres would be partial cut and helicopter yarded. All of the alternatives propose to harvest 195 acres of forest, but Alternatives 2, 3, and 5 would all utilize cable yarding methods. The only difference in these three alternatives is that 70 to 80 percent of the trees over 9 inches DBH would be harvested under Alternative 2, while these units would be clearcut under Alternatives 3 and 5. This difference would only slightly reduce the level of soil disturbance under Alternative 2. There are no differences in the miles of new road to be built under Alternatives 2, 3, and 5 (2.5 miles). Overall, the risk of negative long- and short-term effects to the North Meter Bight watershed would be lowest under Alternative 4 and substantially higher and similar under Alternatives 2, 3, and 5.

Nesbitt Creek

Of the four action alternatives, Alternative 4 would provide the lowest risk of negative effects to the Nesbitt Creek watershed because the lowest amount of new roads would be built (1 mile) (Table 3-26). Also, Alternative 4 would have the fewest number of acres clearcut and cable yarded. Under Alternative 4, the total amount of acres in harvest units (976 acres) is the largest of the action alternatives. However, only 25 percent of the trees over 9 inches DBH would be harvested by helicopter on 966 of those acres. Alternatives 2 and 3 are not widely different in their risk of negative effects from harvest and new road building because both would harvest 413 acres by cable yarding methods and build 6.0 miles of new road. However, Alternative 2 has a slightly lower risk than Alternative 3 because only 70 to 80 percent of the trees over 9 inches DBH would be harvested in the units. Alternative 5 would build 4.5 miles of new road in the watershed and clearcut 208 acres using cable yarding methods. Overall, Alternative 4 would have the least risk of negative long-term and short-term effects while Alternative 3 would have the highest level of risk. Alternatives 2 and 5 would have an intermediate level of risk.

Vial Creek

Alternative 4 provides a slightly lower risk of long-term and short-term negative effects compared to the other alternatives because it includes the highest level of helicopter yarding and the lowest amount of new road building in the watershed. Alternative 4 has the largest total acreage of the action alternatives, but would have less soil disturbance in units which are helicopter yarded (Units 17 and the southern 59 acres of Unit 26). Alternatives 2, 3, and 5 propose to harvest the same units but have different silvicultural and yarding prescriptions. Alternative 2 would use cable yarding to harvest 95 percent of the acreage, with 70 to 80 percent of the trees over 9 inches DBH cut. The remaining 11 acres would be

helicopter yarded. In contrast, Alternatives 3 and 5 would clearcut all of the acreage and would use a cable yarding system.

The amount of new road building would be different between Alternatives 2 and 4 (3.9 miles) and Alternatives 3 and 5 (4.8 miles). Under Option B, the long-term effects of roads in the watershed are similar for all the Alternatives because nearly all of the roads would be placed in storage or stormproofed following harvest.

Project Area

All of the action alternatives would increase the risk of short-term and long-term negative effects to streams and their aquatic life within watersheds that are part of the Project Area compared to the No Action Alternative (Alternative 1). However, in general, the risk of negative effects are relatively minor because of the topography of the Project Area (Table 3-25); the low level of Class III streams within harvest units; and the level of road storage following harvest that would occur under Option B for all alternatives.

All alternatives would be substantially below the 20 percent of the watershed disturbance benchmark. This is a benchmark established by the Forest Plan for relative watershed impact (discussed under Cumulative Effects). The greatest effect would be 12.3 percent for the North Meter Bight watershed (Table 3-27).

Table 3-27
Existing (Less than 30 Years Old) and Proposed Harvest in Acres and Percent of Total Watershed Acreage by Action Alternative

	Existing		Alt. 2			Alt. 3			Alt. 4			Alt. 5		
Watershed	Acres	%	Acres	%	Total %	Acres	%	Total %	Acres	%	Total %	Acres	%	Total %
North Meter Bight	1705	11.0	195	1.3	12.3	195	1.3	12.3	195	1.3	12.3	195	1.3	12.3
Middle Meter Bight	110	3.7	221	7.4	11.1	200	7.4	10.4	221	7.4	11.1	200	6.7	10.4
Vial Creek	10	0.3	302	8.4	8.7	302	8.4	8.7	362	10.0	10.3	302	8.4	8.7
Nesbitt Creek	220	2.2	413	4.0	6.2	413	4.0	6.2	976	9.4	11.6	208	3.0	5.2
Total	2,045		1,131			1,110			1,754			906		

Overall, Alternative 4 would have the least risk of negative effects compared to the other action alternatives because it would have the lowest level of new road building and the largest amount of helicopter yarding. Furthermore, Alternative 4 has a large proportion of harvest units with a 25 percent partial cut prescription (58 percent of acreage). However, Alternative 4 also has the largest total acreage within harvest units because of the partial-cut silvicultural prescription.

The analysis also suggested that the risk of negative effects is not substantially different for Alternatives 2, 3, and 5. Alternative 3 would have a slightly higher risk over the short-term because it would have the highest level of road building and clearcut units that would be cable yarded.

All alternatives propose full suspension yarding across a Class II section of Vial Creek to harvest timber in Unit 26. (In addition, Alternative 4 would harvest 59 acres that are not included in the other alternatives by helicopter.) Therefore, a slight risk exists that woody debris and other logging debris might be introduced to the stream, but BMPs to be implemented should minimize the potential for adverse effects from any debris that falls into the creek.

Cumulative Effects on Freshwater Resources

Future programmed timber harvest entries are likely to occur in the Project Area during the next 100 years, primarily in the Nesbitt Creek and Vial Creek watersheds. Future entries in the North Meter Bight or Middle Meter Bight watersheds are not expected to be large because much of their acreage is included in an old growth reserve. The remaining acreage that has commercial timber value has been cut in previous entries or is proposed in the current project within the Project Area. Approximately 98 acres and 25 acres of commercially valuable timber are available in LSTA harvest units within the Mustang Creek and Middle Meter Bight watersheds, respectively, that were not included in the unit pool for the current project.

Future entries in the Nesbitt Creek or Vial Creek watersheds would primarily occur further downslope, although some commercially valuable timber is available interspersed among units proposed in the current project. Future entries would evaluate the cumulative percent harvest in each watershed. The Forest Service would conduct a more intensive watershed analysis if more than 20 percent of the watershed acres are younger than 30 years (TLMP FEIS, 1997: Appendix J-2). None of the alternatives propose cumulative harvest levels that are close to this benchmark (Table 3-27). Consequently, all of the alternatives meet this TLMP requirement, and it is expected that future entries would be scheduled in a manner that would avoid reaching this threshold in any Zarembo Island watersheds. In the case of unprogrammed salvage timber sales that might exceed the threshold, a detailed watershed analysis should be incorporated into the decision making process.

All alternatives are consistent with the Forest Plan and, therefore, no significant cumulative effects are expected.

Wetlands

Introduction

Wetlands are an active interface between terrestrial and aquatic components of a landscape and are generally characterized by (1) soil that is inundated or saturated long enough during the growing season to typically develop anaerobic conditions, (2) vegetation that grows in water or on a substrate that is at least periodically deficient in oxygen because of excessive water content, and (3) inundation or saturation to the surface during the growing season in most years. The Corps formally defines wetlands as "those areas that are inundated or saturated with surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (40 CFR 230.41 [a] [1]). This definition includes forested swamps, marshes, bogs, and other similar areas.

For Federal regulatory purposes, wetlands are considered a subclass of Special Aquatic Sites (40 CFR Section 230.3) and have been deemed Waters of the United States (33 CFR 328.3). All Waters of the United States are subject to regulation through the Clean Water Act by the Corps and the EPA. Sections 404 and 401 of the Clean Water Act were created specifically with the intent "to restore and maintain the chemical, physical and biological integrity of our Nation's waters." Additionally, Executive Order 11990 requires Federal agencies "to avoid…adverse impacts associated with the destruction or modification of wetlands...wherever there is a practicable alternative." To fulfill this requirement, under Section 404 of the Clean Water Act, the Corps has developed methodology to identify and delineate wetland sites.

Wetland Functions and Values

Wetland ecosystems provide a variety of physical and biological functions. It is important to note that not all wetland sites provide all of the values discussed below due to site-specific characteristics and their location within the landscape. Although wetlands may be similar in structure, they may serve different functions. For example, an emergent wetland may perform significant water quality and flood alteration values, but may not provide groundwater recharge due to an impermeable substrate beneath the wetland.

The National Wetland Policy Forum (Conservation Foundation, 1988) identified eight natural functions that wetlands may perform at a landscape level. Table 3-28 describes the eight natural functions and their benefits.

Table 3-28
Natural Wetland Functions and their Benefit

Function	Benefit
Groundwater recharge	Increased water supplies, blockage or dilution of contamination
Flood flow alteration	Flood control
Sediment stabilization	Shoreline protection
Sediment/toxicant retention	Improved downstream environment
Nutrient removal/transformation	Tertiary waste treatment by nature
Production export	Food chain support
Aquatic diversity/abundance	Food chain support, source of aesthetic pleasure
Wildlife diversity/abundance	Recreational hunting and observation, source of aesthetic pleasure

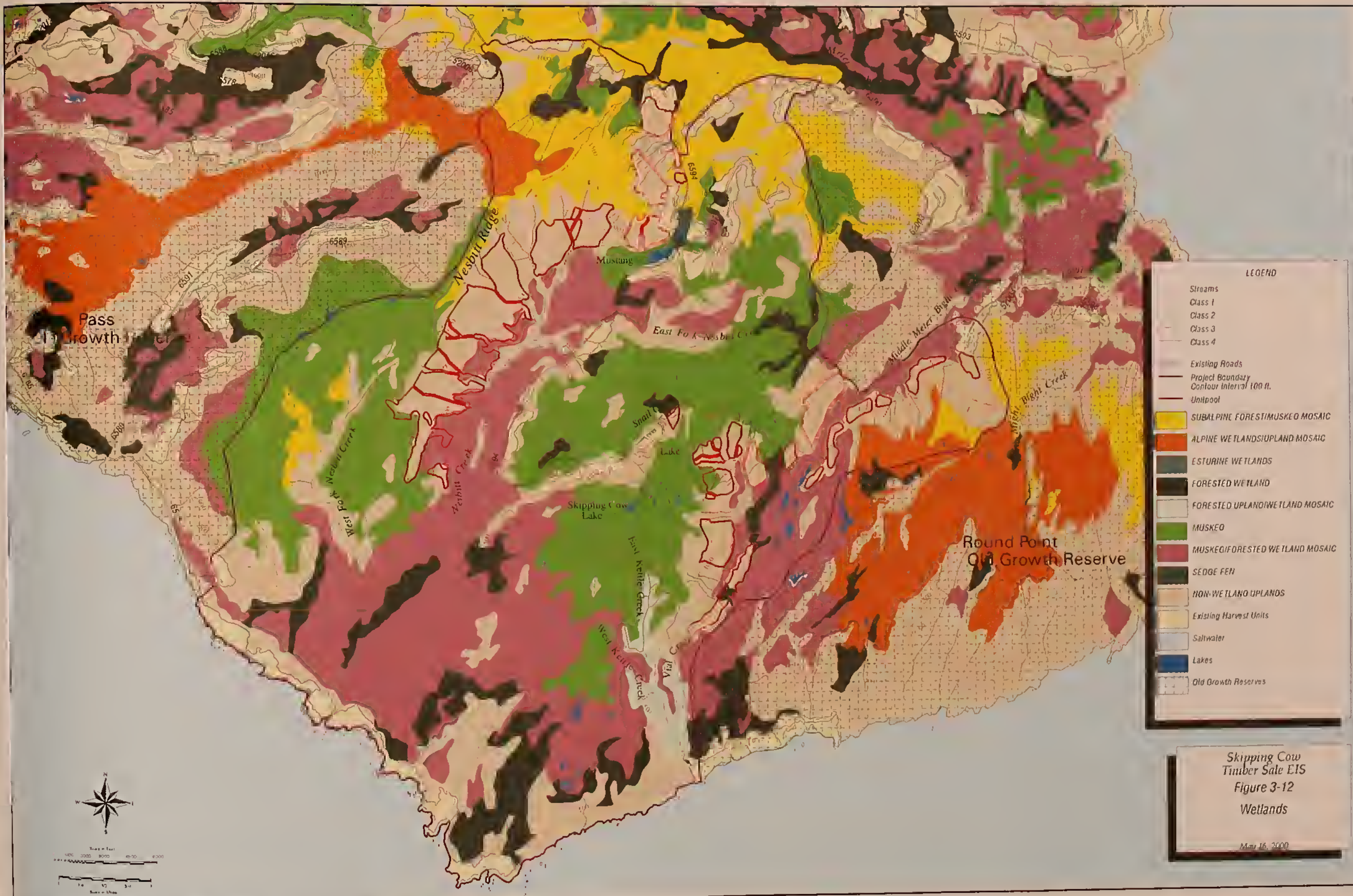
Source: Adapted from Adamus et al., 1991

Wetland Types

Wetland types within this document were delineated using a wetland GIS coverage developed by the Forest Service. It is important to note that wetlands can occur in combination or interspersed with upland type habitats; therefore, some wetland types shown in Figure 3-12 and Table 3-29 are identified as a mosaic complex of the wetland types described in the following paragraphs.

Table 3-29
Wetlands Within Project Area

Wetland Classification	Wetland Acres	Percent of Project Area (25,740 acres total)
Subalpine Forest/Muskeg	1,871	7.3
Alpine Wetland/Upland Mosaic	514	2.0
Forested Wetland	1,985	7.7
Forested Upland/Wetland	386	1.5
Muskeg	6,262	24.3
Muskeg/Forested Wetland Mosaic	6,165	24
Sedge Fen	51	0.2
Estuarine	234	0.9
Total	**17,468**	**67.9**



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Estuarine Wetlands—Estuarine wetlands are unique ecosystems located at the interface of freshwater, terrestrial, and marine environments. These areas typically have poorly drained mineral soils that have higher pH values and nutrient contents than other wetland types. Estuaries support marine invertebrates such as clams and crabs, saltwater fish, and anadromous fish. These species, in turn, support a wide variety of wildlife, including waterfowl, wading birds, bald eagles, small mammals, and bear.

Forested Wetland (Palustrine Forested)—Forested wetlands are dominated by tree species and understories consisting of scrub shrubs, mosses, and sedges. Soils are typically very-poorly-drained organic soils or poorly- and very-poorly-drained mineral soils. Forested wetlands are typically interspersed with open moss muskegs or other types of wetlands as described below and can perform various functions as described in Table 3-28.

Muskeg Non-forested Wetlands (Palustrine Emergent)—Palustrine emergent wetlands are found from low to high elevation, produce and deposit organic matter at a greater rate than it is decomposed, leading to the formation of peat. Muskegs function as areas for recharge of groundwater and streams, and for deposition and storage of sediment and nutrients. Vegetation within these sites is dominated by sphagnum mosses or sedges interspersed with shrubs and stunted trees.

Sedge Fen (Palustrine Emergent)—These wetland types are similar to muskegs, but are dominated by sedges and other herbaceous plants rather than mosses and usually receive some drainage from surrounding mineral soil. Additionally, fens usually maintain greater discharge levels of water yield, which continues throughout the summer (Boelter and Verry, 1997). Fens can also function as recharge of groundwater and streams, and because discharge at these sites remains relatively consistent throughout the summer they can be particularly important for maintaining streams during dry periods.

Alpine and Subalpine Wetlands—Alpine and subalpine wetlands are bogs that occupy the sloping to steep summit of mountains. They are typically dominated by dwarfed shrubs, low sedges, and various forbs. Runoff from these sites can function as recharge for streams located within lower elevations of the landscape.

Palustrine wetlands in the Project Area, particularly fens and muskegs, are moderately important for water quality improvement, flood flow alteration, and biological production. Palustrine wetlands generally play an important role in groundwater recharge and discharge. Estuarine wetlands serve very important biological and water quality functions in relation to primary and secondary productivity, structure and chemical habitat attributes, and species diversity. Hydrologic functions of floodflow alterations and groundwater exchange are of lesser importance in wetlands.

Wetland Management

Wetlands are subject to regulation under Sections 404 and 401 of the Clean Water Act. Exemptions granted under Section 404(f)(1) permit normal agricultural, ranching, and silivicultural activities as well as maintenance of existing drains, farm ponds, and roads. The construction or maintenance of forest roads for silvicultural purposes is exempt from permitting when such roads are constructed and maintained in accordance with BMPs. The BMPs "assure that flow and circulation patterns and chemical and biological characteristics of water of the United States are not impaired, that the reach of the waters of the United States is not reduced, and that any adverse effect on the aquatic environment will be otherwise minimized."

Under the Forest Plan, wetlands are protected by their incorporation into non-development LUDs. In the development of LUDs, the Forest Plan Standards and Guidelines for beach and estuary fringe and riparian areas provide additional protection to wetlands. The Forest Plan also includes forest-wide standards and guidelines for wetlands, which establish a requirement to "avoid alteration of, or new construction on, wetlands, wherever there is a practicable, environmentally-preferred alternative, considering the functions and values of wetlands as well as other non-wetlands ecosystems in the Project Area" (TLMP FEIS, 1997: Chapter 4, Wetlands).

Because the scientific information related to the productive potential of certain soil types is incomplete (Kaikli, Karheen, Kitkun, and Maybeso soil series), harvesting on these four forested wetland soils is to be avoided.

Proposed roads in the Project Area avoid wetlands, to the extent practicable, and minimize impacts to wetland sites by constructing and maintaining roads in accordance with BMPs. In addition, roads would be constructed with a footprint no larger than needed for the removal of timber. Accordingly, proposed roads in the Project Area would meet the requirements for the permitting exemption under Section 404(f)(1).

Effects

Timber harvest and associated activities, such as road construction and use, impact wetland sites. The magnitude of timber-harvest-related impacts to wetlands partly depends on the intensity, location, and duration of the road construction or timber harvest activity.

Tree harvesting in wetland sites may alter wetland hydrology (Verry, 1997). These water table level rises are generally more associated with mineral soils wetlands compared to peatlands. Changes in hydrology patterns of wetland sites can directly influence vegetation species and growth within the wetland site. Excessive water in the substrate checks root growth and microbial activity, and

may even lead to unfavorable biochemical activity (Juhanni-Paivanen, 1997). Additionally, the altered water table and associated streamflow relationship, over vast areas, could increase localized runoff and flooding (Grigal and Brooks, 1997). These effects are generally short-term, and stop once a site becomes revegetated with either emergent, shrub, or forest vegetation. Soil rutting and compaction from timber harvest activities can reduce infiltration, redirect flow, and alter pathways by which water moves through and from wetlands. Construction of roads within wetlands permanently removes the roaded portion, thereby eliminating their biological functions. Additionally, crossing wetlands with roads without adequate provision for cross-drainage can lead to flooding on the upslope side and subtle drainage on the downslope side of crossings (Stoeckeler, 1967; Boelter and Close, 1974).

Water quality of wetland sites can be negativity impacted by harvest activities (Shepard, 1994). Harvest and associated activities (road building and use) can deliver sediment to wetlands, diminish water quality, and lead to the filling of wetland sites. Nutrient pathways within wetlands can also be affected. Nutrients can be removed directly from wetlands, and increases in export of nutrients can occur after harvesting. Additionally, increased soil temperatures following harvest on peatlands leads to an increased potential for decomposition (Trettin and Jurgensin, 1992) and is likely to increase nutrient concentrations in drainage waters (Verry, 1997).

Alternatives

Forested wetlands are proposed for harvest under all of the action alternatives. The greatest amount of forested wetland acres proposed for harvest occurs under Alternative 4 (144 acres) followed by Alternatives 2 and 3 (34 acres each), and Alternative 5 (29 acres) (see Table 3-30).

Inclusions of wetland soil types (Kaikli, Karheen, Kitkun, and Maybeso soil series) have been identified within unit pools (see USDA Forest Service, 1998f). As required by the Forest Plan, harvest is to be avoided on these soil types. Mapped areas of these soils have been deleted from the proposed units. It is recognized, however, that instances where small inclusions of less than two acres are harvested may be unavoidable.

Table 3-30
Acres of Forested Wetlands Impacted by Harvest Scenarios

Harvest Scenario	Alt. 2	Alt. 3	Alt. 4	Alt. 5
25% Harvest	0	0	105	0
70-80% Harvest	34	0	19	0
90% Harvest	0	34	20	29
Total	**34**	**34**	**144**	**29**

3 Wetlands

The most direct effect on wetlands in the Project Area would be the fill associated with road construction. The construction of roads would permanently remove the roaded portions of the wetlands from production. Additionally, sedimentation from road construction and use has been found to alter wetland functions. Table 3-31 shows the miles and acres of road construction on

Table 3-31
Proposed Roads Within Wetland Areas Under the Action Alternatives

Wetland Types	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Forested Wetland (miles)	0.0	0.2	0.0	0.2
Muskeg/forested wetland mosaic (miles)	0.0	1.4	0.0	1.4
Subalpine Forest/muskeg (miles)	1.4	1.4	0.0	1.4
Muskeg Miles	2.6	2.7	2.5	2.5
Total Miles	**4.0**	**5.7**	**2.5**	**5.5**
Acres of Impact[1/]	12	17	7	16
Project Area Wetlands Impacted (%)	0.05	0.07	0.03	0.06

1/ Assume 24-foot-wide road bed.

wetlands, by wetland type, under the four action alternatives. An average road width was calculated at 24 feet. Overall, the largest impact to wetland from roads would occur under Alternative 3 (approximately 5.7 miles/17 acres), Alternative 2 (4.0 miles/12 acres), and Alternative 4 (2.5 miles/7 acres).

Alternatives 2, 3, 4, and 5 have similar mileages and acreages of impact to muskeg wetlands (approximately 2.5 to 2.7 miles/7 to 8 acres) (Table 3-31). In regard to forested wetland types, roading under Alternatives 3 and 5 would impact approximately 3 miles (8 acres) of wetlands each, followed by Alternative 2 (1.4 miles/4 acres). Alternative 4 would not impact any forested wetland sites.

The Forest Plan Standards and Guidelines (TLMP, 1997) require that estuaries be buffered by a 1,000-foot no-harvest zone. Road construction should avoid this buffer but can occur when there is no suitable alternative. During layout of roads and harvest units, estuarine buffers were avoided. The Project Area has no proposed roads or timber harvest within the buffer, which eliminates any direct effects to the estuarine zone. Sediment from road construction and mass wasting that enters streams is eventually delivered to the estuarine zone. Estuaries are natural deposition zones for fine-grained sediments and all aquatic organisms are adapted to this process. Therefore, the small amount of extra sediment that will be delivered due to road construction and timber harvest would have minimal biological effects and should not adversely affect biotic populations.

Mitigation

Mitigation measures designed to protect wetland areas involve, to the extent practicable, the avoidance of wetlands. The use of BMPs in both construction and maintenance ensures that flow, circulation patterns, and chemical and biological characteristics of the wetland's water would be minimally impaired. Implementation of these procedures is required to maintain the physical and chemical functions of wetlands (EPA, 1993; USDA Forest Service, 1995).

Cumulative Effects

Cumulative effects on wetlands would be proportional to the level of harvest and road building that occurred. The cumulative effects of harvest to forested wetlands is anticipated to be minimal. Overall, 655 acres (approximately 2.4 percent) of wetlands within these watersheds have been harvested over the last 100 years and 59 acres (0.14 percent) have been roaded. Due to these low percentage rates, and the relatively low acreage of wetlands affected by the proposed alternatives, significant cumulative effects to wetland resources are not anticipated.

Additionally, revegetation of forested wetland sites generally occurs in the same time frame as other forested sites, usually within 3 to 5 years. Consequently, long-term effects to forested wetlands are expected to be minor. Since growth rates on forested wetlands are expected to be lower than on non-wetland forest sites, merchantable timber from these acreages may not be available under a 100-year rotation.

New road construction on wetland sites would use culverts to minimize disruption of water flow and permeable subgrade materials to avoid restricting the natural movement of water. These measures would ensure that the hydrological, chemical, and biological functions of wetlands would be minimally impaired. The roadbed overlying wetlands will remove the area from production. Road storage and restoring the drainage for the temporary roads would reduce potential sediment deposition to wetland sites within this area. Stormproofing roads left open by providing drivable water bars/rolling dips and gating all new roads would slightly reduce the potential sedimentation of wetland sites due to road use.

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Vegetation and Timber Resources

Affected Environment

The Project Area contains approximately 25,740 acres. Approximately 1,192 acres have been harvested, of which approximately 763 acres are considered managed stands. The remaining harvested areas are in the beach fringe or other currently unsuitable areas. Based on recent field exams, approximately 2,654 acres of the approximately 7,116 acres of tentatively suitable land with mature timber could be harvested using conventional road and cable systems. The Vegetation Resource Report lists the estimated acres and volumes by cable yarding setting. This 2,654 acre area has an estimated volume of 64.1 MMBF of timber. The remaining area appears to be limited to helicopter access (approximately 4,462 acres with an estimated volume of 91.9 MMBF). Approximately 2,634 acres of the suitable land limited to helicopter access is more than 0.75 mile from a road or a potential road. Figure 3-13 shows the average classification for the Project Area. Figure 3-14 shows suitable timber.

Ecological Characteristics-Commercial Species

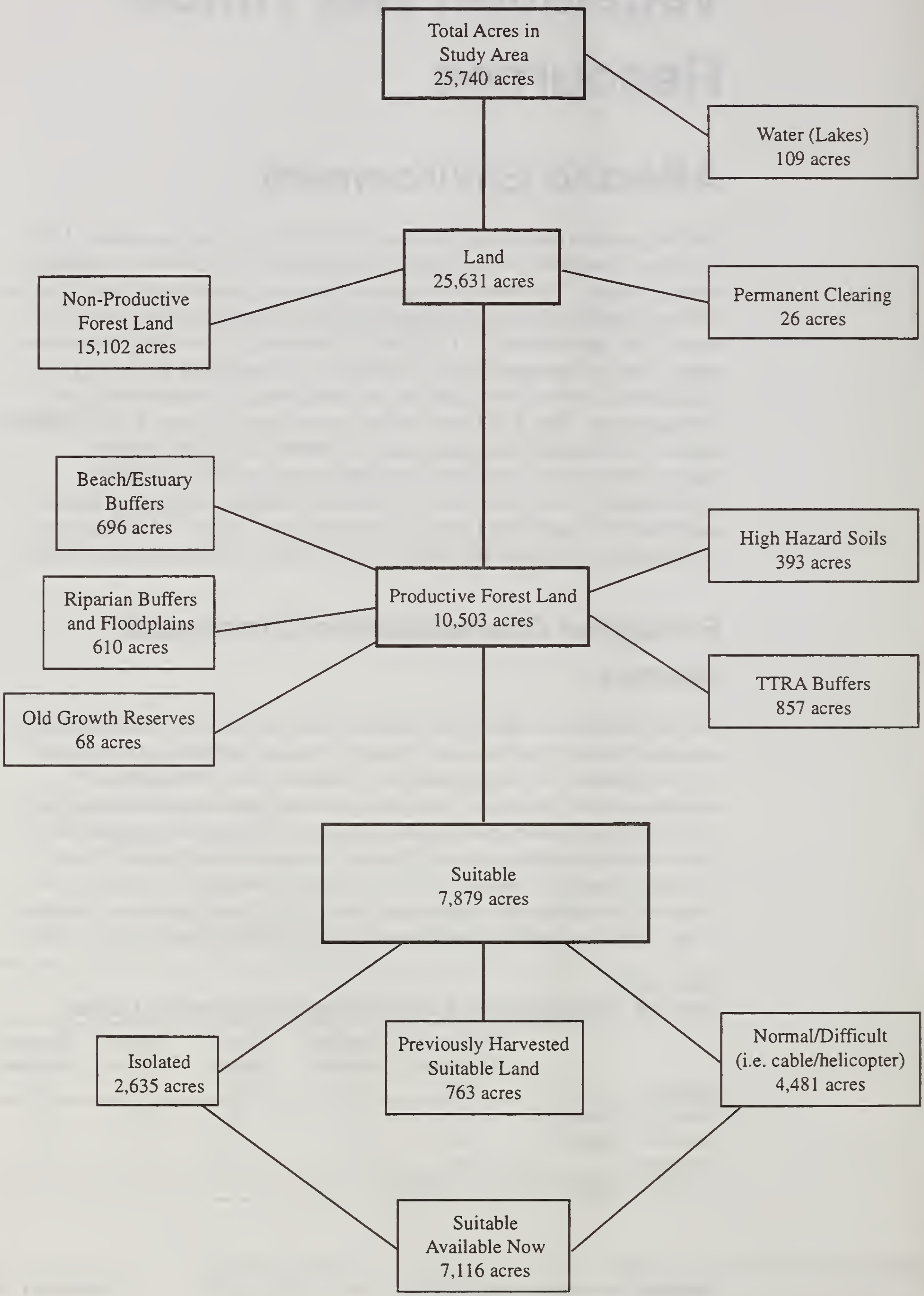
Five commercial tree species are present in the Project Area: western hemlock, mountain hemlock, yellow-cedar, western redcedar, and Sitka spruce. Each species possesses certain characteristics that determine its location and abundance on the landscape. Each species forms plant communities or plant associations with other trees, shrubs, and forbs. The species composition of a plant association reflects the soil, climate, and disturbance history of a site. Species composition estimates for stands being considered for harvest in the proposed alternatives are displayed in Table 3-32. These species are described in the Vegetation and Timber Resource Report (USDA Forest Service, 1998i).

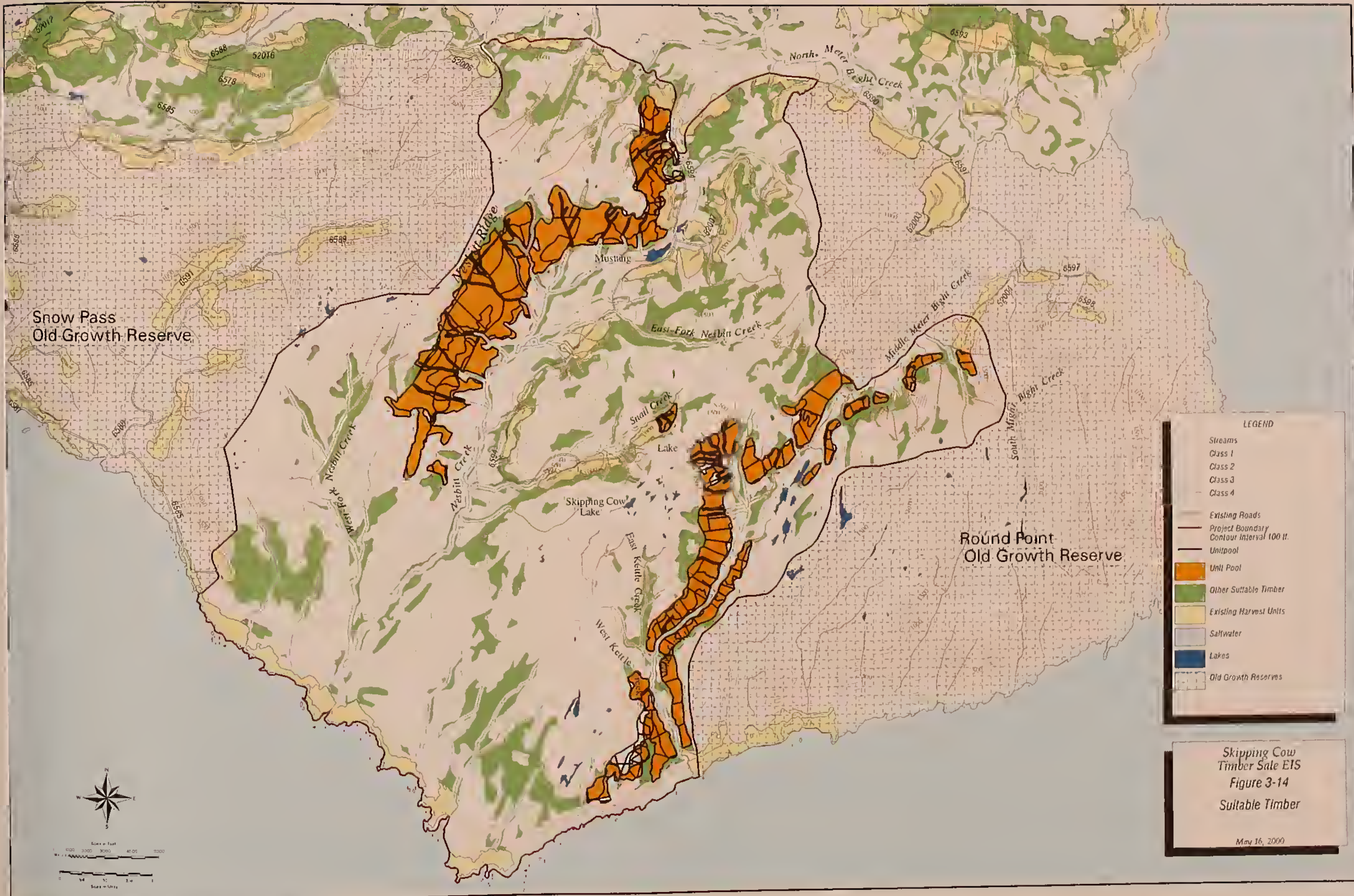
Table 3-32
Species Composition of Stands Being Considered for Harvest

Range[1/]	Western Hemlock (%)	Mountain Hemlock (%)	Sitka Spruce (%)	Yellow-Cedar (%)	Western Redcedar (%)
Stand with Lowest %	29	0	0	0	0
Stand with Highest %	100	33	34	31	47
Average %	59	7	13	14	6

1/ Based on recent stand exams in the Project Area.

Figure 3-13
Acreage Classification for the Skipping Cow Project Area





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Volume Strata

Forests can be divided into a productive and an unproductive component, based on the ability of specific areas to grow trees of a certain size (TLMP FEIS, 1997). Productive forest is divided into three strata: high, medium, and low.

High Volume Strata—These forests have an average timber volume of 29 MBF per acre on the Stikine Area (TLMP FEIS, 1997). The average height of co-dominant trees is greater than 100 feet. Canopy closure is 65 to 95 percent, with western hemlock and/or Sitka spruce dominating most sites. Stands can be even-aged, two aged, or uneven-aged, with small gaps in the overhead canopy. Understory production is moderate. Blueberry (*Vaccinium spp.*) is the dominant shrub; herb cover is 20 to 30 percent, and fern cover is 15 to 30 percent. The Project Area has approximately 1,308 acres of high volume strata late seral forest, approximately 959 acres of which are suitable for timber management. Most high volume forest is in four locations: (1) the upper Nesbitt Creek watershed (south- and southeast-facing slopes on the west side of the creek, along one stretch of Nesbitt Creek, and along one stretch of an eastern branch of Nesbitt Creek); (2) the upper Mustang Creek watershed (east-facing slopes on the west side of the creek); (3) the middle and upper Vial Creek watershed (primarily east-facing slopes on the west side of the creek); and (4) the upper Middle Meter Bight watershed (primarily north-facing slopes on the south side of the creek).

Medium Volume Strata—These forests have an average timber volume of 24 MBF per acre on the Stikine Area (TLMP FEIS, 1997). The average height of co-dominant trees is 70 to 100 feet and canopy closure is 40 to 75 percent. Western hemlock and/or Sitka spruce are still the dominant species (but cedars can be a significant component between 500 to 1,000 feet, and mountain hemlock at higher elevations). The stands are uneven-aged, with numerous gaps in the overhead canopy. The more open canopy results in a more abundant understory. Blueberry (*Vaccinium spp.*) and forbs are more abundant in these forests, ferns are less common. The Project Area has approximately 4,514 acres of medium volume strata late-seral forest, approximately 3,990 acres of which are suitable for timber management. Most medium volume forest is in the same four geographic area as the high volume forest (i.e., upper Nesbitt Creek, upper Mustang Creek, middle and upper Vial Creek, and upper Middle Meter Bight).

Low Volume Strata—These forests have an average timber volume of 17 MBF per acre on the Stikine Area (TLMP FEIS, 1997). Tree height is typically less than 60 feet and canopy closure is 20 to 50 percent. Western hemlock and cedars predominate. The understory is very brushy, dominated by tall thickets of blueberry (*Vaccinium spp.*) and Menzesia (*Menzesia ferruginea*)which tend to diminish the production of herbs, ferns, low shrubs, and forbs. Lichens are relatively abundant. The Project Area has approximately 3,514 acres of low volume strata late seral forest, approximately 2,849 acres of which are suitable

for timber management. Low volume forest is found in patches throughout the Project Area, but generally occurs around muskegs.

Silvicultural Treatments

Silvicultural systems are used to tend, harvest, and re-establish forest stands. Treatments are applied throughout the life of the stand for the purpose of reaching a desired future condition. Treatments include the harvest or regeneration of the stand, intermediate cuttings, and other cultural treatments necessary for the replacement and development of the forest stand. No single silvicultural system can produce all desired combinations of products and amenities from a particular stand or Project Area. A prescription is a written record that includes treatments prescribed for the stand.

Silvicultural systems can be even-aged, two-aged, or uneven-aged. Even-aged systems produce stands with trees of the same or nearly the same age. Two-aged systems produce stands with two distinct age classes and canopy levels, called cohorts. Uneven-aged systems create stands that have three or more cohorts. These systems are discussed in detail in the Wind Ecology section (Issue 5).

All of the areas proposed for timber harvest must be restocked within 5 years. This is required under the National Forest Management Act of 1976 (NFMA). Harvested sites must contain a minimum of 300 well dispersed trees per acre by the fifth year following harvest to be considered successfully regenerated. Regeneration (stocking) surveys will be conducted on all harvest units the fourth full growing season after yarding is completed. This survey is used to determine if additional reforestation efforts, such as planting, are required. Where necessary, a fifth year survey is used to certify that regeneration has been successful.

Precommercial Thinning

Regeneration on clearcuts often results in 1,000 to 3,000 seedlings per acre. Although these stands will thin naturally, production of usable wood fiber can be hastened by reducing the dense stocking. Growth and yield models using a 100-year rotation indicate that precommercial thinning increases timber production. Growth of understory plants and the remaining conifers is accelerated. Precommercial thinning can be used to regulate species composition of crop trees.

Recent trends in forestry have moved toward stands with wider spaced trees. More light penetrates to the forest floor, favoring shrub and forb development and thereby increasing wildlife forage. As stands mature, they reach the stage where tree density begins to block light to the forest floor. Thinning before canopy closure would again promote understory growth, enhance forage production, and increase tree diameter growth. However, wider spacings result in large branches that are retained longer.

Site quality affects the timing of precommercial thinning. Most stands on Zarembo Island are thinned 20 to 25 years after harvest. It is not known if precommercial thinning will have application in uneven-aged systems. It may have use where group selection and diameter limits are prescribed. Precommercial thinning is not likely to occur where individual tree selection is prescribed.

Pruning

Pruning can be used to improve wood quality and increase value by maximizing the amount of clear wood. Wounds created by pruning heal quickly when branches are small. Pruning allows more light to reach the forest floor stimulating the growth of understory vegetation for wildlife forage. To date, only a few second-growth stands on the Tongass National Forest have been pruned. Whether pruning will play an important role in the future in managed forests is not known. More information is needed to evaluate the long-term benefits in relation to the cost associated with pruning in Southeast Alaska.

Commercial Thinning

Currently, commercial thinning is rarely used in Southeast Alaska. Most managed stands are not of sufficient size to produce commercial products. Thinning is rarely economical because of the limited demand for small diameter logs and the expenses associated with logging.

Harvest Methods

In Southeast Alaska, silvicultural options have often been chosen to avoid the risk of windthrow or damage to residuals. In areas of high windthrow risk, either entry was deferred or the stands were clearcut. Other forms of regeneration harvest were generally not considered. Areas with moderate or low windthrow risk were thought to have a wider range of options and some uneven-aged regeneration cuts were made. Uneven-aged systems have also been used in a few areas where there were visual or wildlife habitat concerns.

Economics has also been an important factor in choosing the harvest method. In most situations, clearcutting with cable yarding is more cost efficient than other methods. Although cable yarding is difficult with most uneven-aged systems, it can be used where logs are first yarded laterally a short distance and then yarded uphill through corridors. Where downhill yarding is required, cable yarding does not work well for uneven-aged management, but it can be used on clearcuts. Modifications to clearcutting for downhill yarding have been used to meet visual, wildlife, or other resource concerns. Trees have been left parallel to cable corridors where they would not be impacted by logs being yarded out of the harvest unit. Shovel and helicopter yarding lend themselves to both even-aged and uneven-aged systems. Shovel yarding is often economical but cannot

be used on steep slopes. Helicopter yarding is usually the most expensive yarding method, but some costs can be offset if less road construction is needed.

The Forest Plan identifies three silvicultural systems—even-aged, two-aged, and uneven-aged (TLMP FEIS, 1997, Appendix G). All three systems are being considered in the Skipping Cow Timber Sale. Clearcut harvest with reserves is an example of even-aged management. Removing 70 to 80 percent of the trees over 9 inches DBH is an example two-aged management. Managing a stand by removing 25 percent of the trees over 9 inches DBH every 20 to 30 years is a type of uneven-aged management because it will lead to a stand with three or more age classes. These three types of managed stands together with unharvested areas will be used to create a managed forest that maintains natural disturbance processes and ecological functions and closely resembles natural patterns on the landscape.

Even-Aged Management

The clearcut harvest method removes the entire stand in one cutting with the exception of some reserve trees. The objective of this method is to create a fast growing, even-aged stand to maximize wood fiber production. About 10 percent of the trees over 9 inches DBH would be retained as a biological legacy to maintain some structural and biological diversity in the new stand. These reserve trees would generally be large defective old trees with little commercial value, and they would not be managed for fiber production in the new stand. Reserve trees would be unevenly distributed (e.g., in clumps or groups), their location depending largely on the capability of the cable yarding system.

These sites are expected to regenerate naturally, as have all other previously harvested areas in the Project Area. This stand initiation stage is expected to last 20 to 35 years. The regenerated second-growth stand would remain in the stem exclusion stage throughout most of its rotation age, which is expected to be about 100 to 150 years on most sites. Tree density and species composition can be adjusted by precommercial thinning to maintain a fast growing productive stand. Thinning can also minimize the length of time the stand is in the stem exclusion stage by delaying canopy closure. Reserve trees would remain throughout the rotation; however, some mortality is expected due to blowdown or other causes. When this prescription is used, it has been judged optimal for the site in compliance with the National Forest Management Act. Unit by unit rationale for the selection of prescriptions can be found in the unit cards in Appendix B.

Two-Aged Management

Two-aged management may be used to partially harvest a stand, leaving a significant portion of the original volume on the site. A two-aged system can be designed to achieve a number of objectives. Under one scenario, it can be designed to harvest most of the economically valuable trees while leaving most of the trees that are valuable as wildlife habitat. A large portion of the trees

(about 70 to 80 percent of the trees over 9 inches DBH) would be harvested while all of the small-diameter trees and many of the very large trees would be retained. It would produce a managed stand with two or three cohorts and size classes. Helicopter yarding is especially suited to this type of harvest. Growth rates and regeneration are likely to be slower using this method compared to even-aged management. Precommercial thinning costs would also be higher.

The managed stand would, over time, develop multiple cohorts and multiple size classes of trees. The stand would consist of the newly regenerated trees and the small-diameter leave trees, some of which would release to become crop trees. On sites exposed to strong windstorms, many of the large trees would likely blow over, resulting in a less uniform two-age stand that closely resembles the naturally occurring stands that develop after partial blowdowns. On protected sites, where the large trees would persist, stands are expected to trend toward a multi-aged condition.

Second growth management of these stands would emphasize production of high quality timber while maintaining ecological functions and stand structural characteristics important for wildlife habitat. Post-harvest treatments, if needed to meet this objective, would be based on the specific stand characteristics identified during stand exams. The tree density and species composition of any size class can be altered by precommercial thinning. Thinning may not be needed on some of these stands since regeneration may not be as dense as is typically the case after clearcut harvest. Recent investigations in partially harvested stands in Southeast Alaska indicate that these stands would not likely go through the stem exclusion stage as do even-age stands. Instead, the appearance and structural characteristics are expected to closely resemble the understory initiation stage throughout most of the rotation.

Uneven-Aged Management

Uneven-aged management techniques include single tree selection, small group selection, and removing a fixed percentage of the trees in a stand. Under the method used in the Skipping Cow Timber Sale, only a portion of the trees (about 25 percent of the trees over 9 inches DBH) would be harvested while all of the small-diameter trees and most of the large trees would be retained. This scenario would produce a managed stand that retained most of the cohorts and size classes present in the original stand. Future entries would repeat this prescription every 2 or 3 decades. The resulting stand would mimic many of the characteristics of stands that develop in areas where small-scale blowdown predominates.

The managed stand would have a high level of structural diversity. Enough of the overstory cover would be removed to allow younger trees to grow and seedlings to become established. Shade-tolerant species, such as western hemlock and cedar, would be favored. Large blocks of continuous forest cover could be maintained using this method.

Effects

Alternative 1, the No Action alternative, would not have any direct effects on vegetation at this time. Natural processes would continue until another timber sale is planned. At that time, effects are likely to be similar to those below.

Alternative 2 would result in approximately 1,131 acres being placed under management. These areas would be converted from mature forest to a two-aged stand. Tables 3-33 through 3-35 compare Alternative 2 to the other alternatives.

Alternative 3 would result in approximately 1,131 acres being placed under management. These areas would be converted from mature forest to a single-aged stand of young trees. Tables 3-33 through 3-35 compare Alternative 3 to the other alternatives.

Alternative 4 would result in approximately 1,753 acres being placed under management. About 1,004 acres would be managed as a multi-aged stand and approximately 749 acres would be converted into a single-aged stand of young trees. Tables 3-33 through 3-35 compare Alternative 4 to the other alternatives.

Alternative 5 would result in approximately 906 acres being placed under management. These areas would be converted from mature forest to a single-aged stand of young trees. Tables 3-33 through 3-35 compare Alternative 5 to the other alternatives.

Table 3-33
Harvest Acres and Volume

Timber Harvest	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Acres available for harvest	7,116	7,116	7,116	7,116	7,116
Treatment acres this entry	0	1,131	1,110	1,754	906
Percent of suitable acres treated	0	16	16	25	13
Cumulative suitable acres treated	763	1,894	1,873	2,517	1,669
Cumulative % suitable acres treated	11	27	26	35	23
Harvest Areas					
Acres of NIC I[1/] harvested	0	1,076	1,055	1,675	852
Acres of NIC II[2/] harvested	0	36	36	41	35
Other[3/]	0	19	19	38	19
Logging Systems					
Acres harvested by cable	0	964	1,110	382	906
Acres harvested by helicopter	0	167	0	1,372	0
Harvest Volume					
Cable Volume (MBF)	0	18,810	24,385	7,563	19,068
Helicopter Volume (MBF)	0	3,261	0	14,012	0
Total Volume in Units (MBF)	0	**22,071**	**24,385**	**21,575**	**19,068**
Right-of-way outside units (MBF)	0	160	180	44	109
Total (MBF)	0	**22,231**	**24,465**	**21,619**	**19,187**

1/ NIC I: Areas that can be harvested using standard logging systems (e.g., tractor, shovel, standard cable, and some helicopter).

2/ NIC II: Areas that are difficult and isolated. They can only be harvested using logging systems not commonly used in Southeast Alaska (e.g., balloon, long-span and multi-span skyline, and helicopter with yarding distances greater than 0.75 mile).

3/ Non-forested areas within units

Table 3-34
Harvest Prescription (Acres)

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Even-aged Systems					
Leave 10% of Trees Over 9 Inches DBH	0	0	1,110	449	839
Two-aged Systems					
Leave 20 to 30% of Trees Over 9 Inches DBH	0	1,131	0	296	0
Uneven-aged Systems					
Remove 25% of Trees Over 9 Inches DBH	0	0	0	1,009	67

Table 3-35
Harvest of Late Seral Forest by Volume Strata[1/]

Volume	Alt. 2		Alt. 3		Alt. 4[2/]		Alt. 5	
Strata[1/]	(acres)	% of strata harvested	(acres)	% of strata harvested	(acres)	% of strata harvested	(acres)	% of strata harvested
High	175	14%	174	14%	253	19%	122	9%
Medium	847	19%	828	19%	1,230	27%	708	16%
Low	72	2%	72	2%	229	7%	39	1%

1/ Acres do not equal total acres harvested for each alternative because there are scattered openings and non-forest areas included in the proposed units.

2/ Includes units in the Nesbit drainage, in which only 25 percent of the trees over 9 inches DBH would be removed.

Threatened, Endangered, and Sensitive Plants

The only threatened, endangered, or proposed threatened or endangered plant in Alaska is *Polystichum aleuticum*, which is listed as endangered. It is only known on Adak Island and is not expected to occur in the Project Area.

Twenty-two vascular plants are designated as sensitive in the Alaska Region. Table 3-36 lists the 15 sensitive plants known or suspected to occur in the Wrangell Ranger District of the Tongass National Forest.

A pre-field review of existing information concerning the plants listed above was conducted for the Project Area. This review included the *Regional Forester's Sensitive Species List* and *A Working Guide to the Sensitive Plants of the Alaska Region*. Proposed activities within the analysis area were reviewed and maps and air photos of the area were studied to determine habitat locations.

Table 3-36
Sensitive Plants Suspected or Known to Occur in the Wrangell Ranger District

Goose-grass sedge (*Carex lentiularis var. dolia*)	Suspected
Edible thistle (*Cirsium edule*)	Suspected
Northern rockcress (*Draba borealis var. maxima*)	Suspected
Davy mannagrass (*Glyceria leptostachya*)	Known
Wright filmy fern (*Hymenophyllum wrightii*)	Suspected
Truncate quillwort (*Isoetes truncata*)	Suspected
Calder lovage (*Ligusticum calderi*)	Suspected
Choris bog orchid (*Platantherea chorisiana*)	Known
Bog orchid (*Platanthera gracilis*)	Suspected
Loose-flowered bluegrass (*Poa laxiflora*)	Suspected
Kamchatka alkali grass (*Puccinellia kamtschatica*)	Suspected
Straight-beak buttercup (*Ranunculus orthorhynchus var. alaschensis*)	Known
Unalaska mist-maid (*Romanzoffia unalaschcensis*)	Suspected
Queen Charlotte butterweed (*Senecio moresbiensis*)	Suspected
Circumpolar starwort (*Stellaria ruscifolia ssp. aleutica*)	Suspected

Known Plants

No previously documented sightings of sensitive plants have been reported in the Project Area. At the time the rare plant survey was conducted for this project (July 1998), the only documented reports of sensitive plants on the Wrangell Ranger District were of Choris bog orchid, Davy mannagrass, and Straight-beak buttercup.

Choris bog orchid has been found at several locations on Etolin Island and Wrangell Island, and at one location on Kadin Island and on the mainland. It has also been found at numerous other locations on the Stikine Area, including Mitkof Island, Kuiu Island, Kupreanof Island, and the mainland near Cape Fanshaw. It is also found at other locations throughout Southeast Alaska.

Davy mannagrass is present on Wrangell Island, Etolin Island, and Mitkof Island. Davy mannagrass is very common within Wrangell and Petersburg, where it is especially abundant on wet disturbed sites such as roadside ditches. Recently, it has been found on Kupreanof Island in wet, disturbed soils near Petersburg Lake and in a rock pit on the Tonka Road System.

Straight-beak buttercup is known to occur at a few locations on the mainland along the Bradfield Canal.

Suspected Plants

Five habitats that may support sensitive plants would be affected in the Project Area. These habitats are forest edges, forests, open forests, lake shores, and muskegs.

The sensitive plants listed on Table 3-37 are known or suspected to occur in the Project Area because it contains appropriate habitat and is within the known or suspected range of the plants.

Field Survey for Sensitive Plants

A rare plant survey of Level 1 intensity was conducted for the harvest units and a survey of Level 4 intensity was conducted for the proposed road corridors. A Level 1 survey involves a quick review of the area. The surveyor does not walk completely through the Project Area. A Level 4 survey involves crossing the area more than once and walking the perimeter of the area; most of the area is examined. The Project Area was surveyed by the Stikine Area Ecologist during July 1998. A detailed map showing the exact route of the survey is on file at the Stikine Area office in Petersburg. Daily plant survey forms are in the file for this particular project.

The Choris bog orchid (*Platantherea chorisiana*), a sensitive plant, was located within areas likely to be affected by project activities. No other sensitive plants were found. The choris bog orchid is associated with wet areas dominated by *Sphagnum*. All but one plant was found in this habitat. These areas were generally muskegs, and the plants were usually near the edges of muskegs and had little or no tree cover. Some plants were found in small, wet, open areas within a non-commercial mountain hemlock plant association (mountain hemlock/blueberry/marsh marigold). Plants most frequently associated with the orchid were: *Sphagnum*, skunk cabbage, fern-leaf goldthread, bunchberry, marsh marigold, deer cabbage, mountain cranberry, and swamp gentian. Other bog species were present but were less consistent in their occurrence.

Choris bog orchid was found in six locations: four muskegs, one open forest, and one stream bank location. A total of 18 plants were found. Proposed logging and road construction could affect four of these populations. The other two populations are outside of potential logging units and road corridors. Alternatives 2 and 5 would affect all four of these populations. Alternative 3 would affect the two populations in the Nesbitt area and Alternative 4 would affect the two populations in the Middle Meter Bight area.

Since the proposed project would only affect a small portion of the habitat capable of supporting this species in the Project Area, and since the plant is known to be present at other locations in the area, this project is not expected to contribute to the loss of viability of the species or to create a significant trend towards federal listing (Project BE, 1999).

Table 3-37
Sensitive Plants Targeted for Survey in the Project Area

Goose-grass sedge (*Carex lentiularis var. dolia*)
Found in wet meadows, lake shores, snow beds.

Edible thistle (*Cirsium edule)*
Generally occurs in wet meadows (muskegs) and open forests.

Davy mannagrass (*Glyceria leptostachya*)
Usually occurs in wet areas, usually along streams, ponds, and lake margins. Roots often submerged.

Wright filmy fern (*Hymenophyllum wrightii*)
Found on base of trees and rock outcrops in damp humid woods.

Calder lovage (*Ligusticum calderi*)
Found in alpine habitats and margins of subalpine and mixed conifer forests.

Choris bog orchid (*Platantherea chorisiana*)
Found in open forests, alpine, heaths, and *Sphagnum* bogs (muskegs). Also on moss covered rocks along lake shores and streams.

Bog orchid (*Platanthera gracilis*)
Found in wet meadows and wet open habitats.

Loose-flowered bluegrass (*Poa laxiflora*)
Found in moist lowland woods, open-forested meadows, and upper beach meadows along streams and on moss covered logs and rock ledges at the high tide line.

Straight-beak buttercup (*Ranunculus orthorhynchus var. alaschensis*)
Found in moist lowland meadows and open habitats.

Circumpolar starwort (*Stellaria ruscifolia ssp. aleutica*)
Found in moist gravelly sites and along creeks.

Visual Resources

The Skipping Cow Project Area is located in the south-central portion of Zarembo Island. The southern boundary of the Project Area includes the southernmost shoreline of Zarembo Island, between approximately the mouth of Vial Creek and 2.75 miles northwest of the mouth of the West Fork of Nesbitt Creek. The Project Area ranges from sea level to over 2,400 feet above sea level.

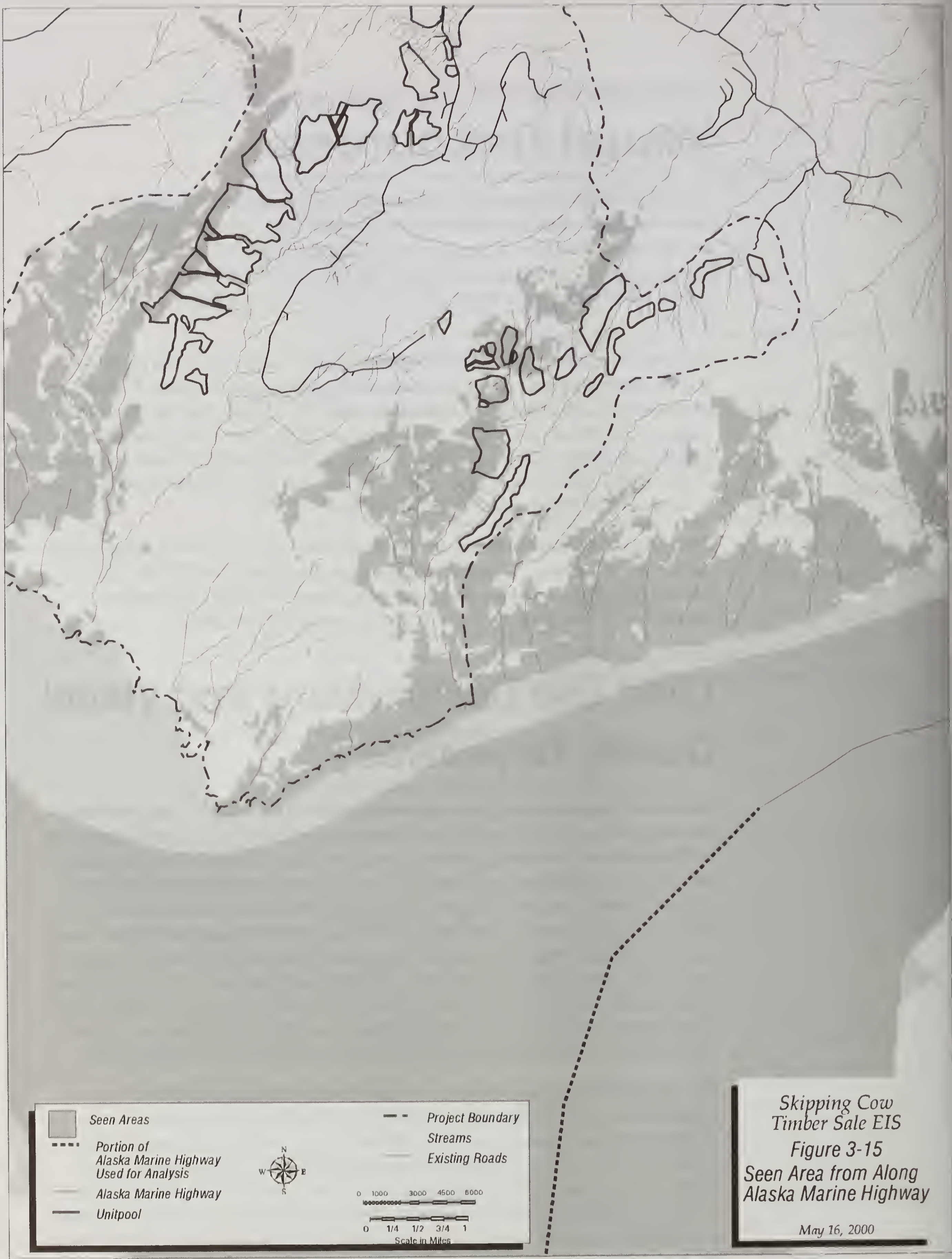
The greatest number of people viewing the Project Area do so from the Alaska Marine Highway route. These viewers include passengers on State of Alaska ferry boats and on private tour boats and ships. The Alaska Marine Highway route passes through the Stikine Strait between Etolin Island and Zarembo Island. The Alaska Marine Highway route is approximately 2.5 miles southeast of the Project Area at its closest point. The portions of the Project Area that can be viewed from the route are depicted in Figure 3-15.

Other locations from which recreationists and tourists can view the Project Area include Snow Passage (Figure 3-16), Clarence Strait, and Road 6594. The viewers from these areas are primarily local people involved in recreation activities or clients brought to the areas by commercial outfitters.

Land Use Designations and Visual Quality Objectives

Most of the Project Area (approximately 97 percent) is located in an area that has been assigned a LUD of Timber Production (Figure 1-2). A small portion of the Project Area (less than 3 percent) along the shoreline east of Nesbitt Point that can be viewed from the Alaska Marine Highway route has been assigned a LUD of Scenic Viewshed. Appendix F of the Forest Plan (Visual Priority Routes and Use Areas; TLMP FEIS, 1997) lists Snow Passage and Stikine Strait as Alaska Marine Highway and tour ship routes; thus, the designation of part of the Project Area as Scenic Viewshed. Another small portion of the Project Area is designated as Old Growth Reserve (less than 1 percent). Areas on either side of the Project Area have also been designated as Old Growth Reserves. These Old Growth LUDs include the beach areas east and west of the Project Area.

The Timber Production LUD has a Visual Quality Objective (VQO) of Modification in the foreground and a VQO of Maximum Modification in the middleground and background for areas that can be seen from Visual Priority Routes and Use Areas, as identified in Appendix F of the Forest Plan (TLMP FEIS, 1997). The VQOs in the Scenic Viewshed portion of the Project Area are Retention in the foreground and Partial Retention in both the middleground and background. Areas that can not be seen have a VQO of Maximum Modification for both LUDs.



Skipping Cow Timber Sale EIS
Figure 3-15
Seen Area from Along Alaska Marine Highway
May 16, 2000

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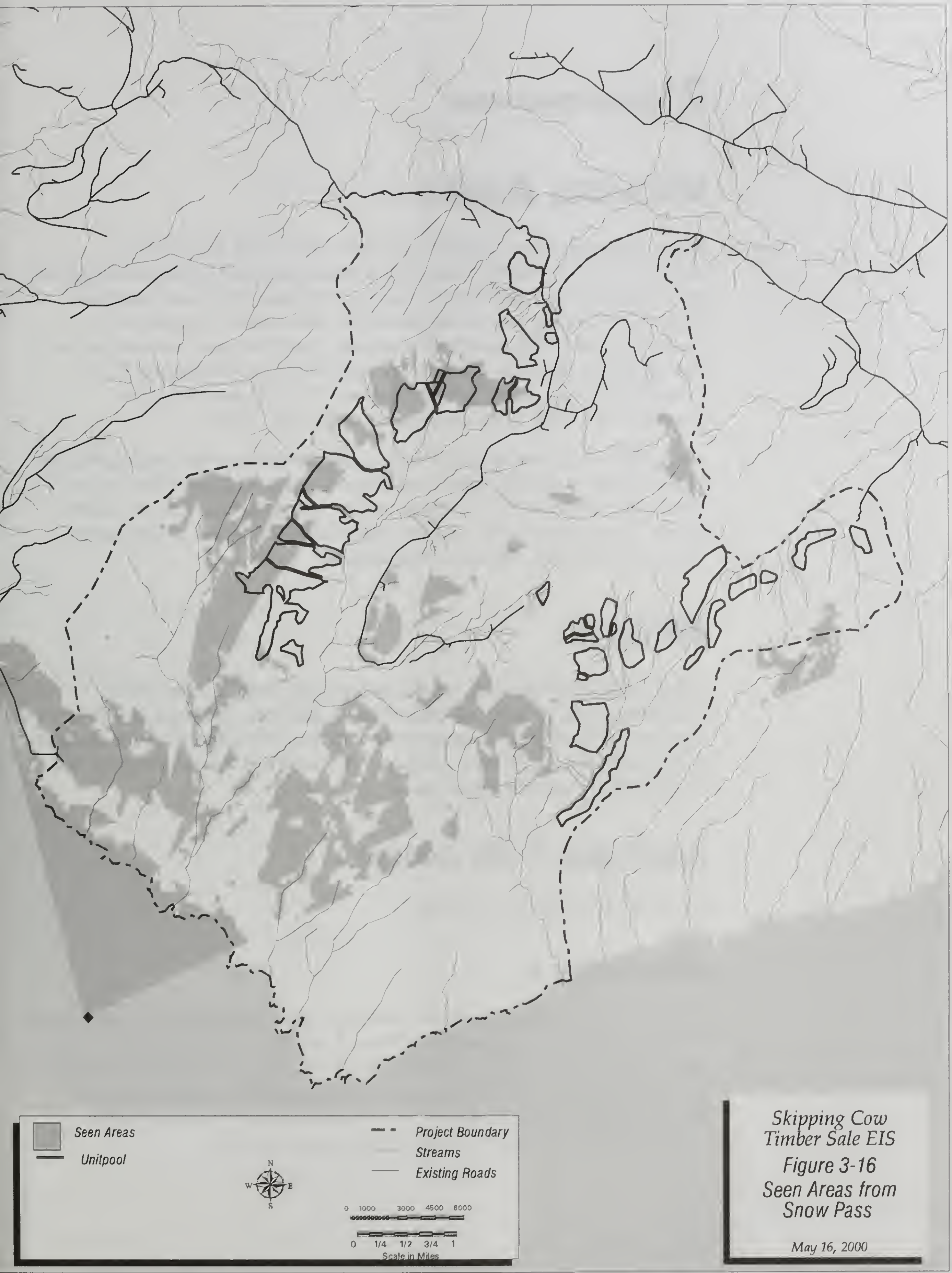

Skipping Cow Timber Sale EIS
Figure 3-16
Seen Areas from Snow Pass

May 16, 2000

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Viewing Areas

Three viewpoints were selected to represent views of the Project Area (Figure 3-17). Viewpoints 1 and 2 are located along the Alaska Marine Highway route and represent views that passengers on the state ferries and tour/cruise ships and boats could see as they pass by Zarembo Island. The portion of Zarembo Island visible from the Viewpoints 1 and 2 is largely undisturbed, as is most of the portion of the Project Area visible from the viewpoints. From Viewpoints 1 and 2, existing older clearcuts (17 to 27 years of age) are somewhat noticeable along the shoreline of the Project Area.

Viewpoint 3 is located in Snow Passage and represents a view that people in the channel between Shrubby Island and Bushy Island would have of the Project Area. Older clearcuts (17 to 27 years of age) along the shoreline are slightly visible. From this location, clearcuts approximately 20 years in age can be observed in the Snow Passage Creek drainage.

Effects

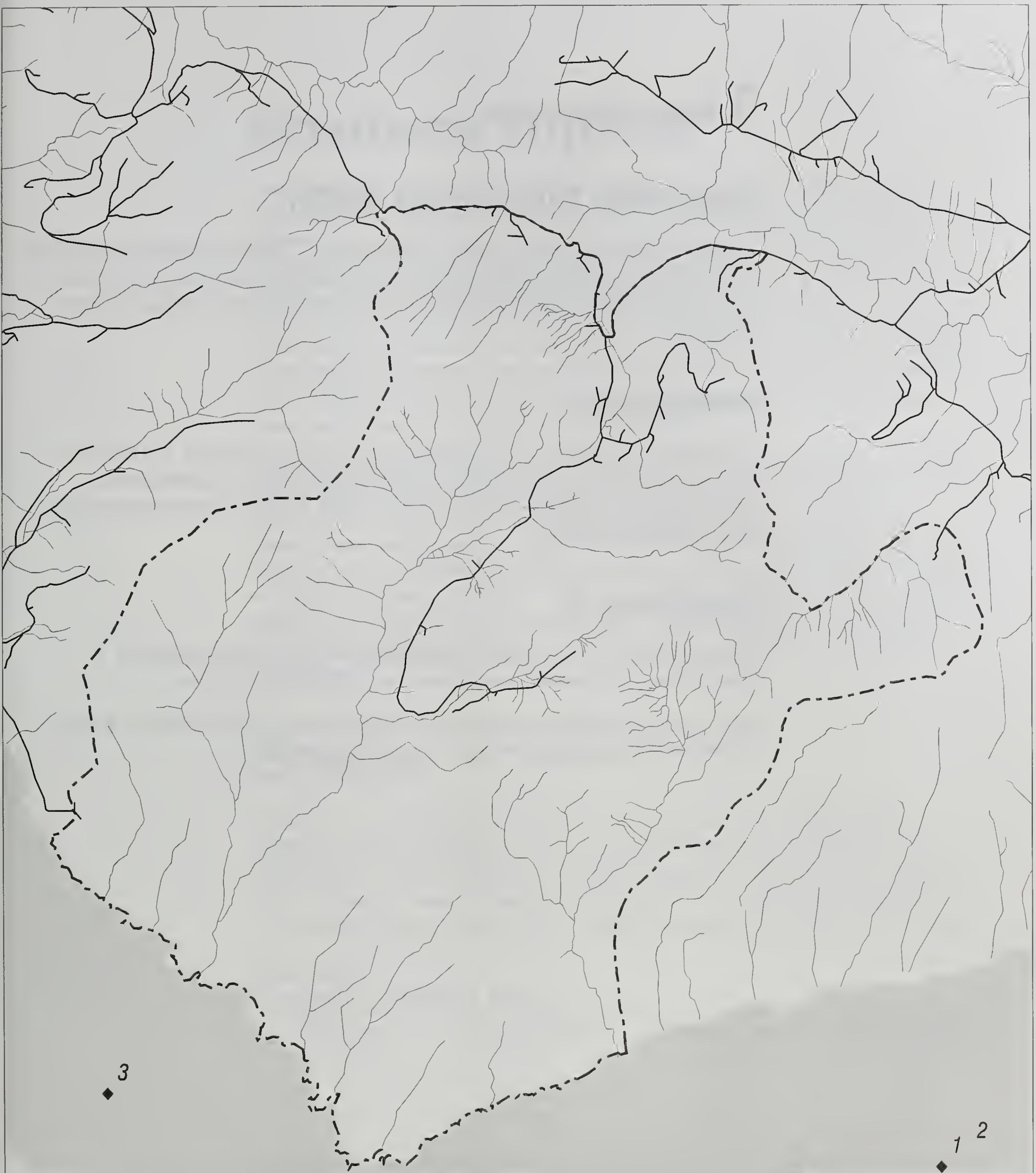
All of the action alternatives would result in some changes to the visual conditions (color, texture, and line) in the Project Area. However, due to the distances between the proposed harvest units and the viewpoints, these changes would not be noticed by most viewers. All alternatives would meet or exceed the VQO criteria for the Project Area.

Alternative 1 (No Action)

No change from current conditions.

Alternative 2

Units 20, 21, 24, and 25 would be visible from the Alaskan Marine Highway and Units 5, 6, and the upper portions of Units 8 through 11 would be visible from Snow Pass. However, these units would not be noticeable to the casual viewer because 20 to 30 percent of the trees over 9 inches DBH would be left in the units and because they would be viewed from a distance of several miles. A change in color and texture would be somewhat noticeable.



Skipping Cow Timber Sale EIS
Figure 3-17
Viewpoint Locations

May 16, 2000

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Alternative 3 (Proposed Action)

The same units would be visible as in Alternative 2. However, these units would be somewhat more noticeable because only 10 percent of the trees over 9 inches DBH would be left. A change in color, texture, and the unit outlines would be noticeable.

Alternative 4

Units 20, 21, 24, and 25 would be the same as under Alternative 3. However, Units 5, 6, 8, 9, 10, and 11 would not be noticeable because approximately 75 percent of the trees over 9 inches DBH would be left. There would only be a slight change in texture.

Alternative 5

Units 5, 6, 8, 20, 21, 24, and 25 would be the same as under Alternative 3. Units 9 through 11 would not be harvested under this Alternative.

Refer to the Visual Resource Report (USDA Forest Service, 1998j) for further details, including perspective plot views of the seen area.

Roadless Impacts

Two Recreation Opportunity Spectrum (ROS) settings are found in the Project Area: Semi-Primitive Non-Motorized (SPNM) and Roaded Modified (RM) (Figure 3-18). Most of the Project Area (approximately 19,620 acres or 76 percent) has not been entered for harvest or other activities and is classified as SPNM. Two areas have been entered for timber harvest over the past 17 to 27 years and have been classified as Roaded Modified (RM). These two areas are linear; one is located along the beach and the other along Road 6594. Together these RM areas comprise approximately 5,270 acres (20 percent) of the Project Area. These two RM areas receive most of the recreational use in the Project Area because they are accessible by road or boat.

The South Zarembo Roadless Area (237) is located on the south side of Zarembo Island (Figure 3-19). It is located partly in the Project Area. It contains approximately 36,238 acres. Approximately 43 percent was allocated to Old Growth Reserve and has been included in the Snow Pass and Round Point Old Growth Reserves which border the Project Area. Another 2 percent was allocated to Scenic Viewshed, a portion of which is in the Project Area. The remaining 55 percent was allocated to Timber Production. Most of this LUD is within the Project Area and has been allocated an ROS setting of SPNM (approximately 19,620 acres).

Effects

Construction of roads as proposed in the action alternatives of this EIS are consistent with the Tongass Forest Plan and 1999 Record of Decision for the Project Area. The roadless area affected is displayed in Figure 3-19. Effects on acres of Roadless Area are listed in Table 3-38. Social and recreational effects of the change in roadless status are discussed in the recreational sections that follow.

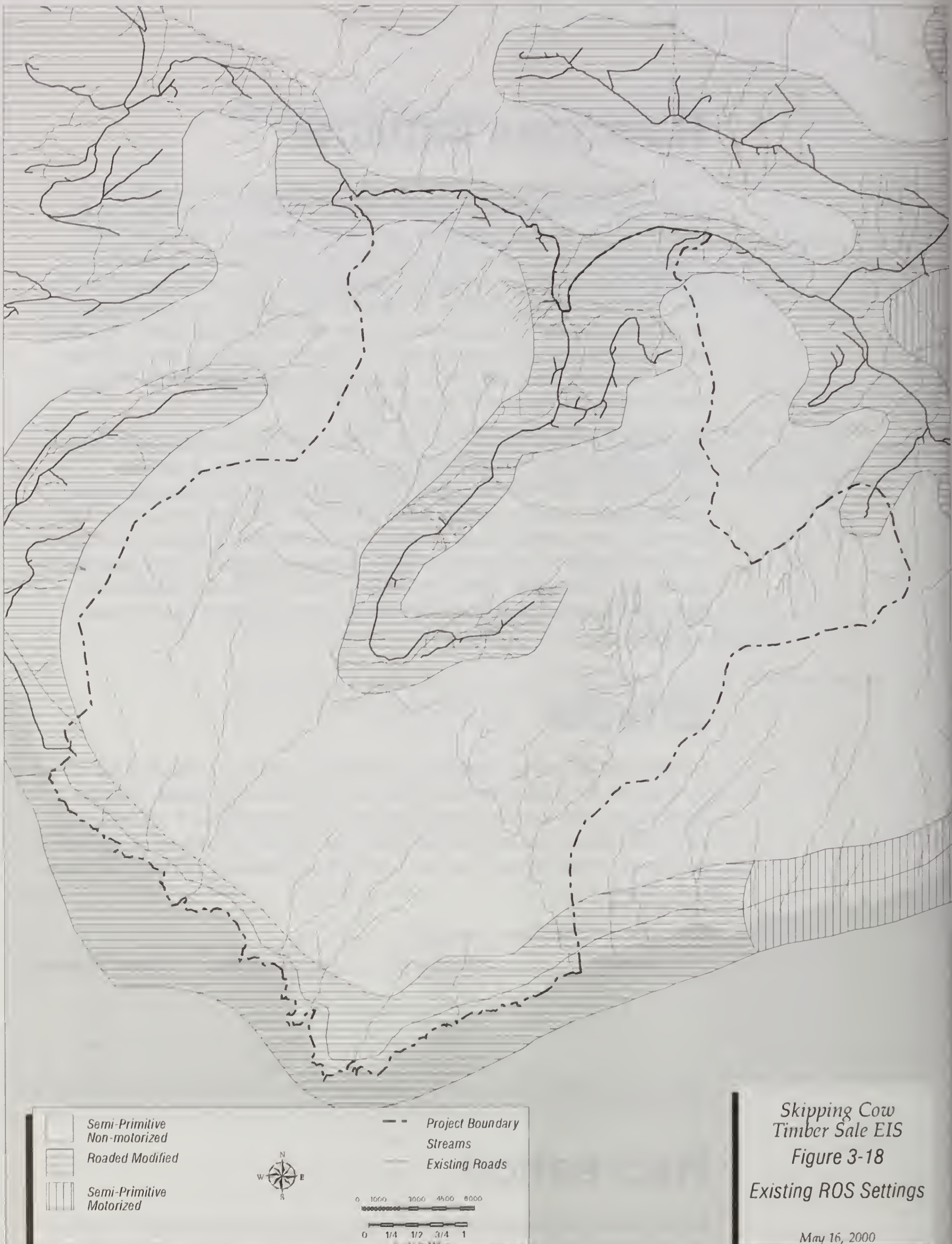
Table 3-38
Changes to Roadless Area 237

Alternative	Acres Removed	Acres Remaining	Percent Remaining
1	0	36,238	0
2	3,103	33,135	91
3	3,002	33,236	92
4	3,945	32,293	89
5	2,169	34,069	94

Area removed from roadless condition includes the area within 1,200 feet of all roads, the harvest units, and the area within 600 feet of the harvest units, including units harvested using an uneven-aged system in Alternative 4.

Recreation

Due to a large deer population, the presence of roads, and proximity to Wrangell and Petersburg, Zarembo Island is very popular with deer hunters. The ADF&G



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Skipping Cow Timber Sale EIS

Figure 3-19

Roadless Area 237

May 15, 2000

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estimates that 421 hunters hunted deer on Zarembo Island in 1997. Deer hunting is the primary form of recreation on Zarembo Island. Although most of the hunting that occurs on Zarembo Island may be considered subsistence hunting, there is clearly a recreational component.

Most hunters access Zarembo Island via one of the two Forest Service docks from which all-terrain vehicles (ATVs) can be offloaded. The St. John Harbor dock is located on the northwest side of the island and the Roosevelt Harbor bulkhead is located on the northeast side of the island. Both docks provide access to Forest Service roads that lead to Road 6594, which enters the Project Area from the north. On the opening day of a recent hunting season, Mr. Ed Crain of ADF&G counted 25 boats at St. John Harbor and over 14 boats at Roosevelt Harbor (personal communication, Ed Crane, Area Wildlife Biologist, ADF&G, Petersburg, Alaska, August 5, 1998).

Although most hunters use the Forest Service docks to access the islands, some hunters use skiffs or other boats to access shoreline areas. Due to prevailing winds and lack of protection in the southern part of the island, including the Project Area, it is not believed that as many skiff hunters access the southern part of the island.

Based on personal conversations conducted by the subsistence specialist as part of the subsistence data gathering, it is clear that most of the hunting that occurs on Zarembo Island occurs along roads and near access points. Several people noted that some hunters go out of their way (by walking beyond where roads end) to reach alpine areas where the larger bucks tend to be found. These hunters are looking for "trophy" animals with large racks or a quality hunt and are not hunting solely for meat. Less hunting occurs in the Project Area than in other parts of the island because there are fewer roads.

Recreational saltwater fishing and beach use also occurs in the proximity of the Project Area, particularly along Snow Passage. Although there are fish-bearing streams on the island (including the Project Area), it is not known how much stream fishing occurs in the Project Area.

Recreation Places

There are two recreation places in the Project Area. One recreation place is Number 22043.10 (Zarembo—South Beach/Snow Passage). This recreation place is located along the southernmost portion of Zarembo Island and includes all of the southern boundary of the Project Area. The second recreation place is Number 22043.04 (the Middle Road). This recreation place follows Forest Road 6590 (the Middle Road) and includes Road 6594.

Outfitter and Guide Use

Based on preliminary conversations, there does not appear to be frequent use of Zarembo Island by local guides and outfitters. Although some guides have expressed concern that the presence of clearcuts is perceived negatively by some of their clients, it appears that clients primarily see Zarembo Island when they pass by it on a boat or plane, not from on the island.

Effects

Four potential effects to recreation would occur as a result of implementing Alternatives 2 through 5. These four effects would be:

- The expansion of the Zarembo Island road system into unroaded areas
- A change in ROS settings as a result of building roads
- Changes in the type of hunting available in the Project Area
- Effects on outfitters and guides

The expansion of the Zarembo Island road system into the Project Area is discussed under Road Access. As depicted in Table 3-6 (Issue 2: Road Access Management), the alternatives could leave up to 13.8 miles of road open for motorized access.

The changes to ROS which would result from implementing any of these alternatives are consistent with the changes anticipated in the Forest Plan. The effects on outfitters and guides would be the same under all alternatives. Essentially, there would be very little, if any, quantifiable effects on outfitters and guides. Based on telephone conversations with outfitters and guides, very few, if any, outfitters or guides take their clients to Zarembo Island to hunt. The Forest Service has not received any requests nor use records indicating outfitter and guide activities in the project area. Some outfitters and guides do take clients past Zarembo Island on the way to several saltwater fishing areas. Several of the outfitters and guides reported that customers would not be disturbed to see clearcuts while others stated that the recreational experience of some customers would be negatively affected by observing additional clearcut harvest units on Zarembo Island. None of the alternatives should have a negative effect on outfitters because most of the units would not be visible from saltwater, the visible units would be at least several miles away from where outfitters and guides would likely be taking customers and the intent of the mitigation measures would be to give the harvest units (including clearcuts) the appearance of natural openings.

Table 3-39 displays how each alternative would affect ROS settings and the type of hunting opportunities that would be available.

Table 3-39
ROS Settings by Alternative

	Alt. 1		Alt. 2		Alt. 3		Alt. 4		Alt. 5	
	Acres	% Change	Acres	% Change	Acres	% Change	Acres	% Change	Acres	% Change
Roaded Modified	6,092	NA	11,689	+91	11,689	+91	12,149	+99	10,784	+77
Semi-Primitive Motorized	0	NA	2,504	NA	2,504	NA	2,504	NA	2,504	NA
Semi-Primitive Non-Motorized	19,649	NA	11,548	-41	11,548	-41	11,088	-43	12,453	-37

Alternative 1 (No Action)

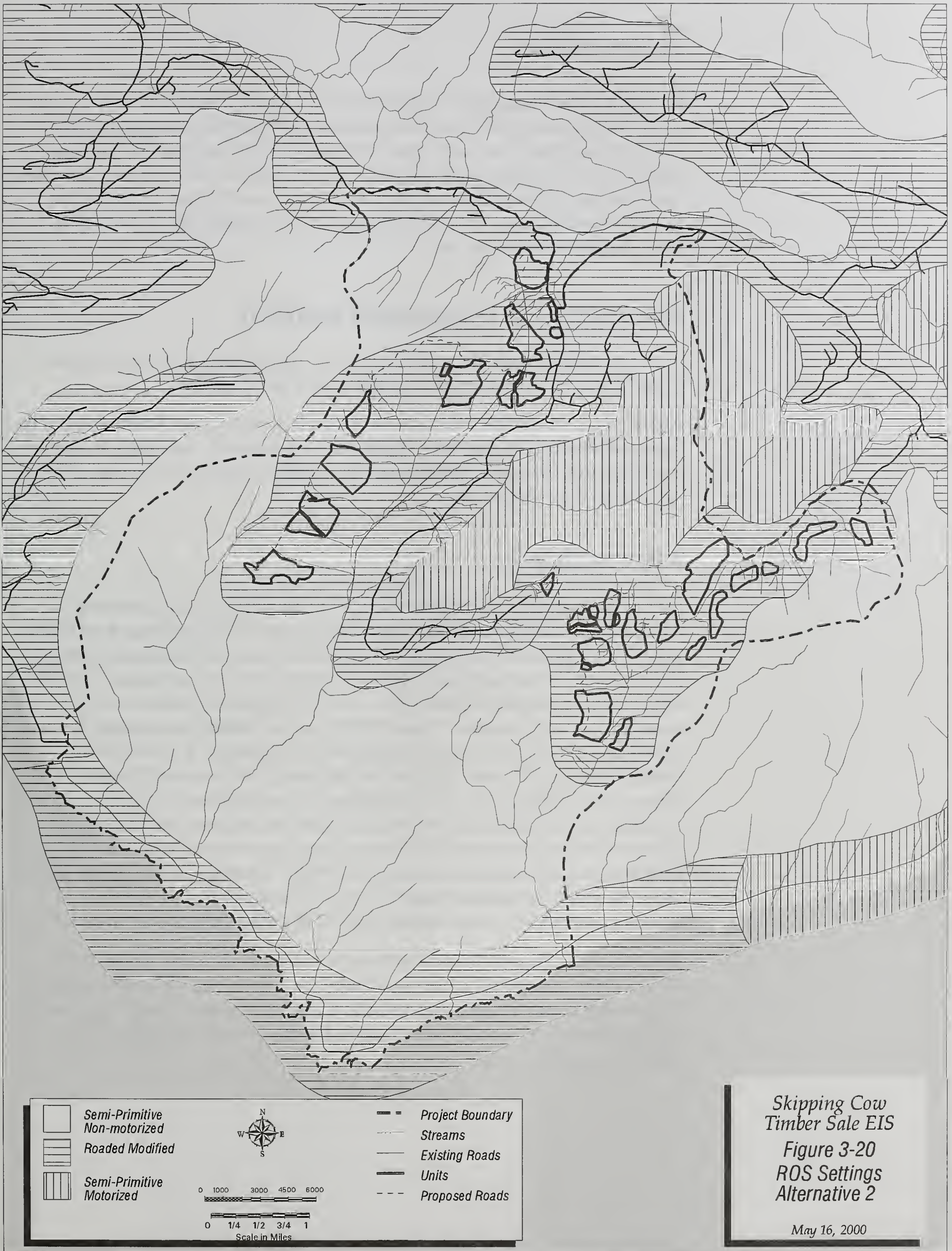
Under Alternative 1, current ROS settings, unroaded areas, and recreation patterns (primarily hunting) would continue. Because the Forest Plan has assigned a LUD of Timber Production for most of the Project Area (nearly 97 percent), it can be assumed that harvest activities will occur in the Project Area at some time in the future. When harvest does occur, the effects on recreation may be similar to the effects discussed for the following alternatives. Until the time when harvest would occur, recreational use of the Project Area would be expected to remain as described above.

Alternative 2

Alternative 2 would construct approximately 9.6 miles of new system roads that could be left open for motorized use. In addition, 1 mile of existing but impassable road would be reopened. The roads and harvest associated with Alternative 2 would change existing ROS settings (Figure 3-20). Approximately 5,597 acres of SPNM would be converted to RM and 2,504 acres to Semi-Primitive Motorized (SPM) (Table 3-39). This would provide an additional 8,101 acres of area accessible to recreationists preferring motorized recreation settings (RM and SPM) and would eliminate 8,101 acres of area for recreationists preferring unroaded, primitive recreation settings (SPNM).

If the roads associated with Alternative 2 (and all other alternatives) are closed to motorized access, the ROS settings for the foreseeable future would remain the same as if the roads were left open. If the roads become impassable to ATVs, the roads could be used as trails by recreationists. Eventually the ROS settings near the roads would return to pre-roaded conditions.

Leaving new roads open to motorized use under Alternative 2 would expand the Zarembo Island road system into areas that are currently only accessible by foot. Hunters would be the primary group to take advantage of the new roads. Hunters that prefer to hunt areas accessible by vehicle would use the new roads, and would likely take advantage of new roads that provide access to higher elevations. Hunters that currently walk into some of the higher portions of the Project Area may go other places for remote hunting experiences.



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If all of the roads associated with Alternative 2 (and all other alternatives) were to be closed to motorized use, fewer people would hunt in the areas the roads would access than if the roads remained open to motorized use. Some people would likely use the roads illegally and some would walk into the areas the roads would access. Although closing the roads would result in less use of the area than leaving them open, even closed roads would increase use of the Project Area compared to existing use.

Alternative 3 (Proposed Action)

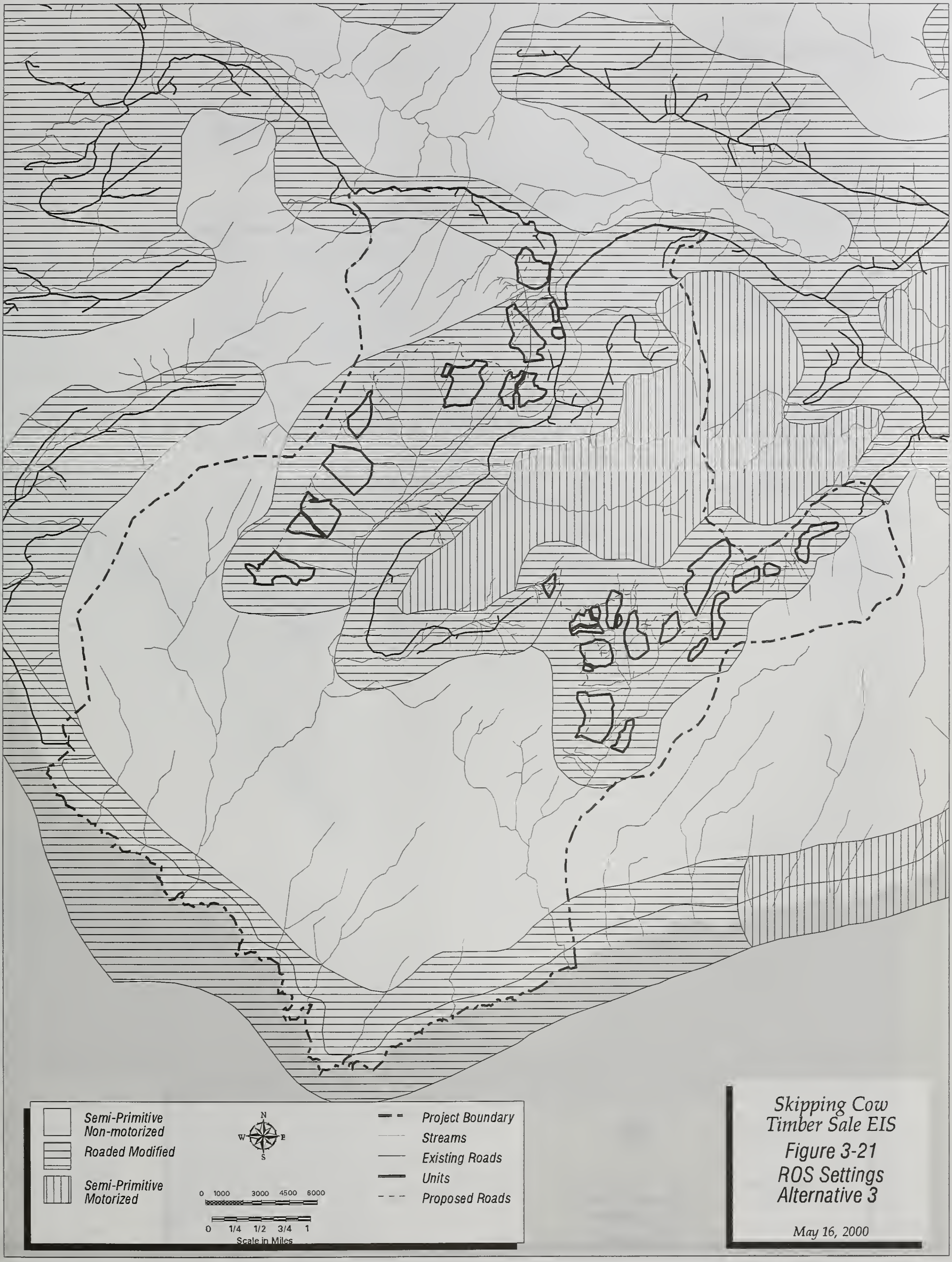
The primary difference between Alternatives 2 and 3 would be the additional construction of 2.2 miles of new system road (Road 52034).

Alternative 3 would have the same effects on ROS settings as Alternative 2 if the roads are left open (Figure 3-21, Table 3-39). If the roads were not left open to motorized use, the effect on ROS settings would be the same as that described in Alternative 2 for that option.

Alternative 4

Alternative 4 would build approximately 7.6 less miles of road compared to Alternative 3 and would reduce clearcutting in the Nesbitt drainage in an effort to have less effect on deer habitat. Road 52033 would not be extended along Nesbitt Ridge, avoiding approximately 5.9 miles of new construction. The area would have 25 percent removal of trees over 9 inches DBH rather than be clearcut. As in Alternative 2, Road 52034 into the Middle Meter Bight drainage would not be built. The roads associated with Alternative 4 would convert approximately 6,057 acres of SPNM to RM, and 2,504 acres of SPNM to SPM (Figure 3-22, Table 3-39). This would provide an additional 8,561 acres of area accessible to recreationists preferring motorized recreation settings (RM and SPM) and would eliminate 8,561 acres of area for recreationists preferring unroaded, primitive recreation settings (SPNM). Although the helicopter units above Nesbitt Creek do not contain roads, it is assumed that the presence of harvest units would warrant changing the ROS setting from SPNM to RM.

The area above Nesbitt Creek would not be roaded at all under Alternative 4. This could be considered a lost opportunity for hunters that would hunt this area if it became accessible by motor vehicle. Conversely, hunters desiring a hunting experience away from roads would prefer that the area above Nesbitt Creek remain unroaded.



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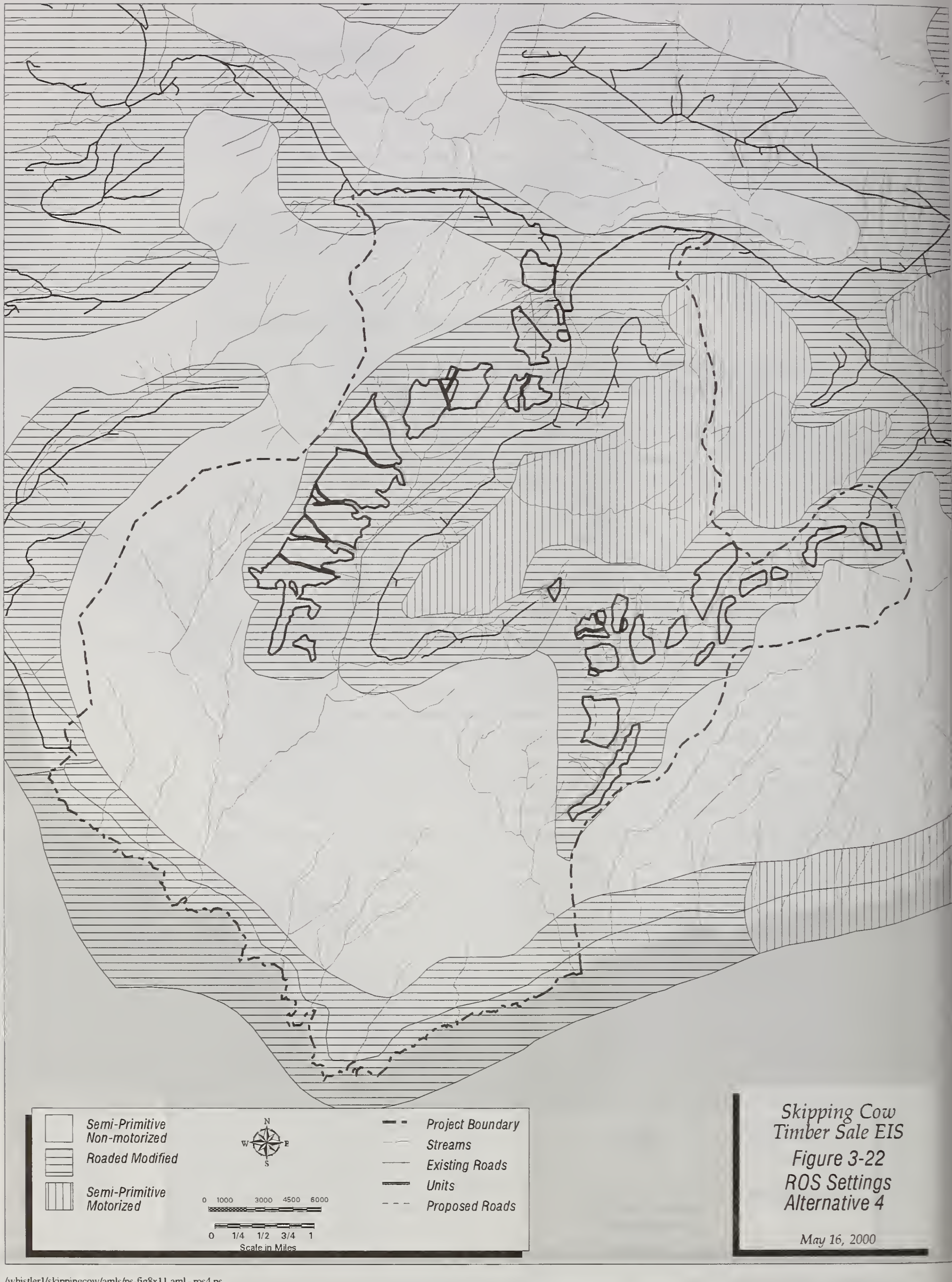

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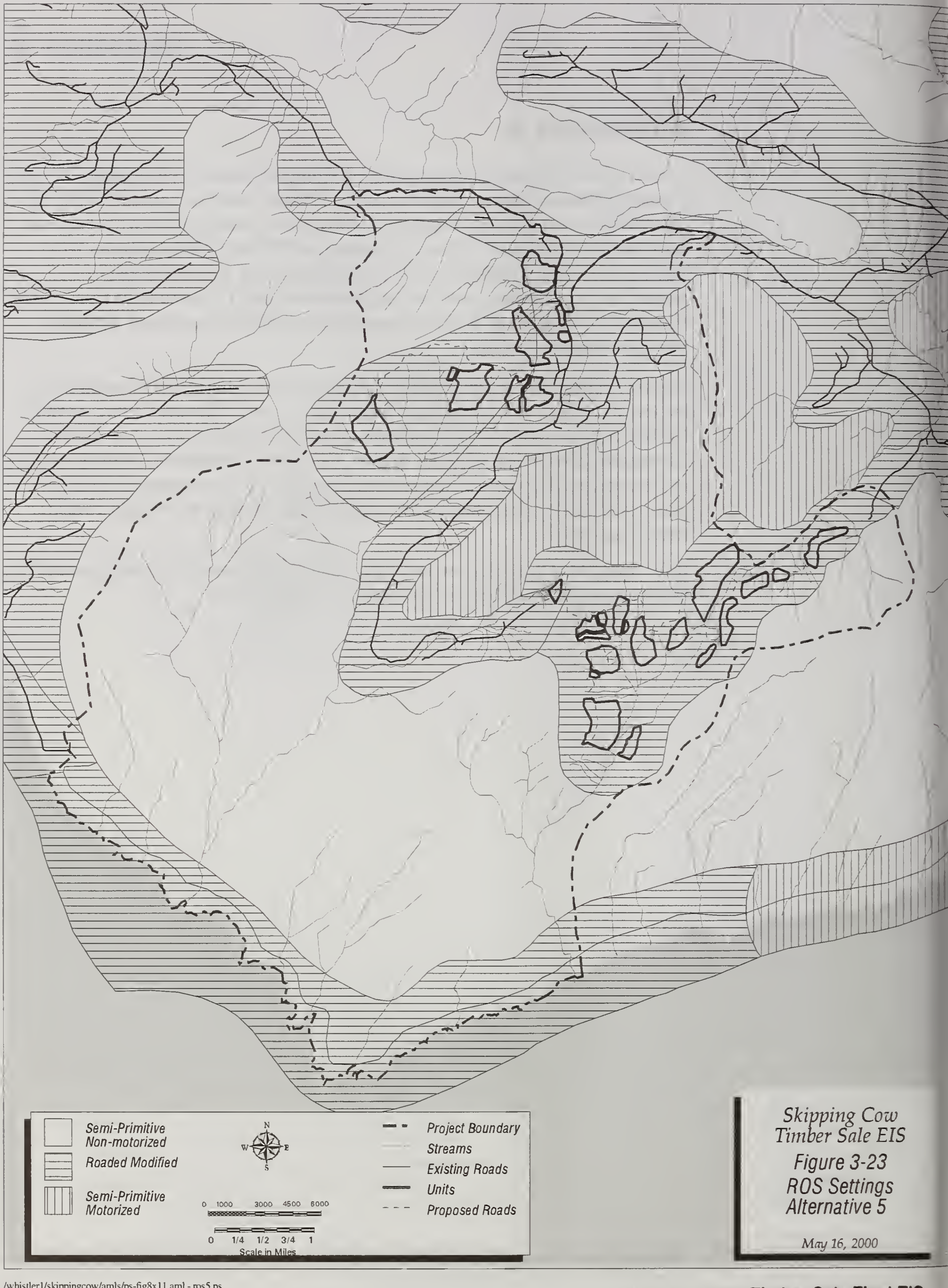
Alternative 5

The effects of Alternative 5 on recreation would be similar to Alternative 3. The primary difference is that with Alternative 5, there would be approximately 1.1 miles of less road that could be open to the public. Alternative 5 would convert 4,692 acres of SPNM to RM and 2,504 acres of SPNM to SPM (Figure 3-23, Table 3-39). This would provide 7,196 more acres of area accessible to recreationists preferring motorized recreation settings (RM and SPM) and would eliminate 7,196 acres of area for recreationists preferring unroaded, primitive recreation settings (SPNM).

The 10.7 miles of road that could be left open under Alternative 5 would allow hunters to access areas currently inaccessible by road. However, less area in the Nesbitt drainage would be accessible by motorized vehicles. As discussed in Alternative 2, hunters that prefer to hunt areas only accessible by vehicle would use the new roads, whereas hunters that currently walk into some of the higher portions of the Project Area, would prefer that the area above Nesbitt Creek remain unroaded.

If the roads were not left open to the public, the effect on ROS settings would be the same as that described in Alternative 2 for that option.



Skipping Cow Timber Sale EIS

Figure 3-23
ROS Settings
Alternative 5

May 16, 2000

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Heritage Resources

Archaeologists conducted a detailed literature search and performed a field survey of the Project Area. Archaeologists recorded 23 culturally modified trees scattered along the coastline and a historic cabin site (PET-453) near Point Nesbitt. The culturally modified trees do not appear to meet the eligibility criteria for the National Register of Historic Places because of their scattered nature and lack of associated cultural material. The historic cabin does appear to meet the National Register eligibility criteria (Criterion D), primarily because of its historical significance and possible association with a former Stikine Tlingit camp and fort site. The historic site is located within a 1,000-foot beach fringe buffer zone and it would not be affected by the proposed project.

The Forest Service has submitted a report to the Alaska State Historic Preservation Office (SHPO) describing the results of the literature search and field survey. We requested their opinion on the National Register eligibility of the historic cabin site (PET-453) and our determination that there would be no affect to this site as a result of the proposed alternatives. The State responded concurring that "the eligible site will not be affected by the proposed timber sale" (ADNR, 1998). The 23 culturally modified trees are also located within the beach fringe and would also not be affected by the proposed project.

The potential timber harvest units and roads would be all located in the low sensitivity zone for heritage resources, as defined by the programmatic agreement between the Forest Service and the Advisory Council. Therefore, we have determined that there are no sites eligible for the National Register of Historic Places within the areas of potential effect for the Skipping Cow Timber Sale.

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Other Environmental Considerations

Cumulative Effects

Cumulative effects for this and other projects discussed below are in line with those effects analyzed in the cumulative effects analysis included in the Forest Plan (TLMP FEIS, 1997), which is incorporated by reference.

We considered cumulative effects of past and present projects in the area, but such activities are not likely to lead to significant cumulative effects beyond those disclosed in this EIS. Known actions include past harvest and road building. Approximately 102 miles of road open to motorized traffic (including 4.7 miles passable only by ATVs) exists on Zarembo Island. Approximately 14,179 acres have been harvested. Approximately 24,970 acres of suitable timber remain.

Under Forest Plan goals and objectives, more harvest would likely take place in the Project Area, but, except for salvage of dead trees, it is not likely to occur for many years. Our best estimate is that additional programmed timber harvest in the Project Area is not likely to take place for 20 to 30 years. We do not believe the effects of such possible harvests are reasonably foreseeable; nor are environmental and regulatory conditions that would exist in 20 to 30 years well enough known to forecast effects of such a possible entry. Some blowdown is likely to occur under any alternative, including No Action. Where or when this will occur cannot be accurately predicted beyond that discussed under Issue 5.

Cumulative effects from past, present, and proposed actions are discussed under the cumulative effects sections of the Issue 3: Wildlife; Issue 4: Subsistence; Geology, Soils, and Geomorphology; Wetlands; and Fisheries and Watersheds sections of this Draft EIS. The proposed Baht Timber Sale (estimated at 10 MMBF) and the proposed Skipping Cow Timber Sale, both expected to be offered within the next five years, are the only large planned sales on Zarembo Island. The Baht Timber sale would be on the north side of the island and would not contribute to cumulative effects within the Project Area. However, both sales would contribute to cumulative effects on the Island. Plans exist to offer the Deer Run Salvage Sale in the near future. This sale would harvest approximately 100 MBF of blowdown on the north end of the island. Together, these sales could harvest up to 10 percent of the remaining suitable timber on the island. These actions are consistent with the Forest Plan and their cumulative effects were considered in the Forest Plan (TLMP FEIS, 1997).

The St. John state land selection is tentatively designed for general use and settlement. If settlement occurs on Zarembo Island, the cumulative effects, including road use, could be much greater than the effects from actions which have occurred up until now. This is too speculative to analyze at this time.

Irreversible and Irretrievable Commitments of Resources

Irreversible and irretrievable commitments of resources involves resources that would be affected, but that would not be returned or that could only return over long periods of time.

Use of petroleum fuels and rock sources for road and sort yard construction commits non-renewable resources. Alternative 1, the No Action alternative, has no effect on mineral resource use at this time.

Constructing roads in the Project Area would irreversibly reduce the amount of roadless area and opportunities related to the roadless character. Alternative 1 would not have these consequences.

Under all of the action alternatives, there would be an irretrievable loss of old-growth forest unless rehabilitation occurs over a period as long as 250 to 300 years. Due to increased fragmentation, other old growth areas adjacent to harvest units would have their habitat values reduced for those species that prefer interior habitat.

Energy Requirements and Conservation Potential of the Alternatives

The implementation of the proposed alternatives will require the expenditure of energy (consumption of fuel). The amount of energy used varies by alternative, based on the timber volume harvested, the type of harvest system used, the amount of road construction, and sale preparation and administration.

Fuel Consumption

Fuel Consumption requirements were estimated as follows:

Timber Sale Preparation and Administration	1.56 gallons per MBF
Cable Logging	2 gallons per MBF
Helicopter Logging	8 gallons per MBF
Load, Haul, Dump, and Tow	8 gallons per MBF
Road Construction	4,000 gallons per mile
Road Maintenance	20 gallons per mile

The estimated fuel consumption required for each alternative is displayed in Table 3-40.

Table 3-40
Estimated Fuel Consumption (Thousands of Gallons)

Activity	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Cable Logging	0	37.6	48.8	15.1	38.2
Helicopter Logging	0	26.3	0	112.3	0
Load, Haul, Dump, Tow	0	176.6	195.1	172.6	152.8
Road Construction	0	42.4	51.2	20.8	46.8
Road Maintenance	0	0.5	0.6	0.4	0.6
Timber Sale Preparation/Administration	0	34.4	38	33.7	31.4
Total Consumption	0	317.8	333.7	354.9	279.8
Average Gallons per MBF	0	14.4	13.7	16.5	13.9

Conservation Potential

To conserve fuel, and to minimize costs, the Forest Service has undertaken studies nationwide and on the Stikine Area of the Tongass National Forest and has allowed experimentation with new or different equipment or techniques. Cable yarding uses about 75 percent as much fuel as shovel yarding and about 25 percent as much fuel as helicopter yarding. However, helicopter yarding can reduce road building needs, saving fuel needed for road construction, road maintenance, and trucks hauling logs on the roads.

The use of low-tire-pressure equipment (central tire inflation [CTI]) during road construction and logging has also been shown to decrease costs, both in nationwide studies and in studies on the Stikine Area. Studies on Mitkof Island indicate that 10 to 14 percent less rock was needed during road construction, resulting in cost savings of approximately $450,000. It is predicted that costs for rock replacement/road maintenance, log truck fuel, and tire repair and replacement will decrease using this system. Cost savings have proven to be

substantial enough that the Forest Service provides a contract clause allowing a reduction in deposits for rock replacement when low-tire-pressure equipment is used.

The use of cable yarding equipment fitted with mechanical or hydraulic interlocks reduces yarding costs, because one does not have to ride the throttle and brake simultaneously to provide deflection for the turn of logs.

Unavoidable Environmental Effects

Although we designed harvest units and roads to avoid adverse consequences, and have included mitigation measures, some environmental impacts cannot be completely mitigated and would be expected to occur.

Air quality would diminish on a recurring, temporary basis due to the construction of roads, timber harvest, and hauling. Limbs and logging slash would be burned at sort yards intermittently throughout the logging periods, which would deposit minor amounts of particulate matter and smoke into the air.

Although BMPs are designed to protect soil and water, some potential for surface erosion, sediment production, channel erosion, and mass movement does exist. Road development poses a risk of sediment production. However, the degree of risk posed by the proposed roads is not unusually high. Road locations are largely in stable terrain. Helicopter yarding in Alternatives 2 and 4 reduces the risks associated with road building. Sediment production could displace fish or result in a loss of habitat near stream crossings and temporarily affect the function of the freshwater system.

Increased human activity both during and after logging, and loss of habitat, would result in impacts to fish and wildlife species, particularly those populations that have low numbers or are more sensitive to the presence of people. The habitat for old growth associated species would be reduced. Travel corridors between old growth blocks in adjacent watersheds would also be reduced in size, which may affect the ability for individuals to disperse and genetic material to exchange among local populations of species.

Social and Economic Effects

We do not anticipate measurable social or economic effects due to this project, beyond those disclosed in Chapter 3 (Issue 1 and Issue 4). Broad-based assessment of these effects were done in the TLMP FEIS, 1997 (Chapter 3).

A Civil Rights Impact Analysis (CRIA) is used to identify any possible impacts associated with a proposed project based on an individuals civil rights (religion,

race, color, national origin, age, gender, disability, marital status, political beliefs). We have no indication, nor have any comments been received, that would lead us to believe that any of the alternatives considered for the proposed project would impact any individual's civil rights. This conclusion tiers to the Economic and Social Environments Analysis included in Chapter 3 of the Forest Plan FEIS (TLMP FEIS, 1997).

Other Findings

The effects of the alternatives on consumers is reflected in the discussion of the various goods and services supplied as a result of the proposed alternatives. We have determined that the actions proposed in the alternatives would not adversely affect prime farm land, range land, rivers eligible for Wild and Scenic River designation, Class II Airshed standards associated with the Clean Air Act, or Wilderness, nor would it adversely impact civil rights, lower income groups, women, or minorities. None of the alternatives would have an adverse effect on environmental justice.

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Chapter 4

Lists

Chapter 4
Lists

Acronyms

ACMP	Alaska Coastal Management Program
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources
ANCSA	Alaska Native Claims Settlement Act of 1971
ANILCA	Alaska Native Interest Lands Conservation Act of 1980
ATV	all-terrain vehicle
BA	Biological Assessment
BE	Biological Evaluation
BF	board feet
BMP	Best Management Practices
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
Corps	U.S. Army Corps of Engineers
CRIA	Civil Rights Impact Analysis
CZMA	Coastal Zone Management Act of 1976
DBH	diameter at breast height
DGC	Division of Governmental Coordination
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
GIS	geographic information system
GMU	Game Management Unit
HCI	habitat capability index
HCM	habitat conservation model
IDT	Interdisciplinary team
km	kilometer
LSTA	Logging Systems Transportation Analysis
LTF	log transfer facility
LUD	Land Use Designation
LWD	large woody debris

MBF	thousand board feet
MIS	Management Indicator Species
MMBF	million board feet
MMI	Mass Movement Index
MP	Mile Post
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NFMA	National Forest Management Act of 1976
NMFS	National Marine Fisheries Service
NWI	National Wetland Inventory
Project Area	Skipping Cow Project Area
RM	Roaded Modified
ROD	Record of Decision
ROS	Recreation Opportunity Spectrum
RPA	Resources Planning Act of 1974
SHPO	State Historic Preservation Office
SPM	Semi-Primitive Motorized
SPNM	Semi-Primitive Non-Motorized
TLMP	Tongass Land Management Plan
TRUCS	Tongass Resource Use Cooperative Survey
TSPIRS	Timber Sale Program Information Reporting System
TTRA	Tongass Timber Reform Act of 1990
USDA	United States Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
VCU	Value Comparison Units
VQO	Visual Quality Objective
WAA	Wildlife Analysis Area

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Forestry Technician, Wrangell Ranger District, Tongass N.F.
Forestry Technician, Oroville Ranger District, Plumas N.F.

Alan Olson, Fisheries, Watershed
B.A. Aquatic Biology, University of California
M.S. Fisheries Science University of Washington
Foster Wheeler 4 years, Fisheries Biologist
EA Engineering 7 years, Fisheries Biologist

Bill Pawuk, Ecologist
B.S. Forestry, Penn State University
M.S. Plant Pathology, University of New Hampshire
Ph.D. Plant Pathology, University of New Hampshire
Forest Service 26 years
Ecologist, Stikine Area, Tongass N.F.
Nursery Manager, Stikine Area, Tongass N.F.
Research Plant Pathologist, Southern Forest Experimental Station
Plant Pathologist, Forest Insect and Disease Survey.

Scott Posner, Wildlife Biologist
B.S. Wildlife, University of Minnesota
M.S. Forest Ecology, University of Minnesota
Forest Service 10 years
Wildlife Biologist, Wrangell Ranger District, Tongass N.F.
Wildlife Biologist, South Ecological Management Unit, Bighorn N.F.

Gray Rand, Wildlife Biologist
Post-Baccalaureate Work, Environmental Science, Washington State University
B.S., Biology, Washington and Lee University
Foster Wheeler 5 years

Jim Schaefer, District Engineer
B.S., Education, Bemidji State University

Jim Schaefer, District Engineer
B.S., Education, Bemidji State University
Forest Service 28 years

Rob Rogers, Geology/Soils
B.S. Geology, Appalachian State University
M.S. Geology, Geomorphology, Colorado State University
Foster Wheeler 6 years, Geomorphologist
U.S. Peace Corps 3 years, Geologist

Julianne Thompson, Hydrologist
B.S. Natural Resource Management, California Polytechnic State University
Forest Service 10 years
Hydrologist, Wrangell Ranger District, Tongass N.F.
Hydrologist, Stikine Area, Tongass N.F.
Hydrologist, Dixie N.F.

Eric Urstadt, Logging Systems, Timber Economics
B.S. Forest Engineering, Oregon State University
Stuntzner Engineering and Forestry 5 years, Logging Engineer
Oregon Department of Forestry 4 years, Logging Engineer
Menasha Land and Timber 3 years, surveying and Logging Systems

Susan Wise-Eagle, Geographic Information Systems (GIS)
B.S. Zoology, San Diego State University
Forest Service 18 years
GIS, Wrangell Ranger District, Tongass N.F.
Fishery & Wildlife Biologist, Wrangell Ranger District, Tongass N.F.
Fishery & Wildlife Biologist, Salmon River Ranger District, Nez Perce, N.F.
Fishery Biologist, St. Mary's Ranger District, Idaho Panhandle N.F.

Sandy Yu, Word Processing Lead
Certified with Microsoft Software
Foster Wheeler 1 year

Glossary

A-frame Log Transfer Facility
Log transfer facility system which consists of a stationary mast with a falling boom for lifting logs from trucks to water. This system is generally located on a shot rock embankment with a vertical bulkhead to access deep water, accommodating operations at all tidal periods.

Access
The opportunity to approach, enter, and make use of public lands.

Access Management
The designation of roads for differing levels of use by the public.

Adaptive Management
A continuous process of action-based planning, monitoring, research, evaluation, and adjustment with the objective of improving implementation and achieving desired management goals and objectives.

Aerial Harvest Systems
See Logging Systems

Alaska National Interest Lands Conservation Act (ANILCA)
Passed by Congress in 1980, this legislation designated 14 National Forest wilderness areas in Southeast Alaska. Section 810 requires evaluations of subsistence impacts before changing the use of these lands.

Alaska Native Claims Settlement Act (ANCSA)
Approved December 18, 1971, ANCSA provides for the settlement of certain land claims of Alaska natives and for other purposes.

Alaska Pulp Corporation (APC)
Previously Alaska Lumber and Pulp Corporation.

All-terrain Vehicle (ATV)
A wheeled vehicle less than 40 inches wide.

Allowable Sale Quantity (ASQ)
The maximum quantity of timber that may be sold each decade from suitable lands covered by the Forest Plan.

Alluvium
A deposit of sand or mud formed by moving water.

Alluvial Fan
A fan-shaped deposit of sand, gravel, and fine material made by a stream where it runs out onto a level plain or meets a slower stream.

Alpine
Parts of mountain above tree growth and/or the organisms living there.

Alpine/Subalpine Habitat
The region found on a mountain peak above tree growth.

Alternative
One of several policies, plans, or projects proposed for decision-making.

Amenity
Resource use, object, feature, quality, or experience that gives pleasure or is pleasing to the mind or senses. Amenity values typically are those for which monetary values are not or cannot be established.

Anadromous
Fish that ascend from the sea to breed in freshwater streams.

Anadromous Fish
Anadromous fish spend part of their lives in fresh water and part of their lives in salt water. Anadromous fish include pink, chum, coho, sockeye, king salmon, and steelhead trout. There are also anadromous Dolly Varden Char.

Anadromous Fisheries Habitat Assessment
An assessment conducted in 1994 within the Tongass National Forest (published in 1995) to study the effectiveness of current procedures for protecting anadromous fish habitat and determine the need for any additional protection.

Analysis Area
An area of land which has the same timber management costs and responses to timber management activities.

Aquatic Habitat Management Unit (AHMU)
A mapping unit that displays an identified value for aquatic resources. It is a mechanism for carrying out aquatic resource management policy.

Class I: Streams and lakes with anadromous or adfluvial fish habitat; or high quality resident fish waters listed in Appendix 68.1, Region 10 Aquatic Habitat management Handbook (FSH 2609.24), June 1986; or habitat above fish migration barriers known to be reasonable enhancement opportunities for anadromous fish.

Class II: Streams and lakes with resident fish populations and generally steep (6-15 percent) gradient (can also include streams from 0-5 percent gradient) where no anadromous fish occur, and otherwise not meeting Class I criteria. These populations have limited fisheries values and generally occur upstream of migration barriers or have other habitat features that preclude anadromous fish use.

Class III: Perennial and intermittent streams with no fish populations but which have sufficient flow or transport sufficient sediment and debris to have an immediate influence on downstream water quality or fish habitat capability.

These streams generally have bankfull widths greater than 5 feet and are highly incised into the surrounding hillslope.

Class IV: Intermittent, ephemeral, and small perennial channels with insufficient flow or sediment transport capabilities to have an immediate influence on downstream water quality or fish habitat capability. These streams generally are shallowly incised into the surrounding hillslope.

Non-streams: Rills and other watercourses, generally intermittent and less than 1 foot in bankfull width, little or no incisement into the surrounding hillslope, and with little or no evidence of scour.

Background
The distance part of a landscape. The seen or viewed area located from 3 to 5 miles to infinity from the viewer. See also Foreground and Middleground.

Beach Fringe Habitat
Habitat that occurs from the intertidal zone inland 1,000 feet, and islands of less than 50 acres.

Bedload
Sand, silt, and gravel, or soil and rock debris rolled along the bottom of a stream by the moving water.

Benthic
Refers to the substrate and organisms on the bottom of marine environments.

Best Management Practice (BMP)
Practices used for the protection of water quality. BMPs are designed to prevent or reduce the amount of pollution from nonpoint sources or other adverse water quality impacts while meeting other goals and objectives. BMPs are standards to be achieved, not detailed or site-specific prescriptions or solutions. As defined in the USDA Forest Service's Soil and Water Conservation Handbook, BMPs are mandated for use in Region 10 under the Tongass Timber Reform Act.

Biological Diversity (Biodiversity)
The variety of life in all its forms and at all levels. This includes the various kinds and combinations of: genes; species of plants, animals, and microorganisms; populations; communities; and ecosystems. It also includes the physical and ecological processes that allow all levels to interact and survive. The most familiar level of biological diversity is the species level, which is the number and abundance of plants, animals, and microorganisms.

Blowdown
See windthrow.

Board Foot
A unit of wood measuring 12 inches by 12 inches by 1 inch (12"x12"x1"). One acre of commercial timber in Southeast Alaska yields on the average 18,000 to 34,000 board feet per acre (ranging from 8,000 to 90,000 board feet per acre).

One million board feet (MMBF) would be the volume of wood covering one acre two feet thick. One MMBF yields approximately enough timber to build 120 houses.

Bog
An undrained or imperfectly drained area with a vegetation complex composed of sedges, shrubs, and sphagnum mosses, typically with peat formation. See also Muskeg.

Bole
Trunk of the tree.

Braided Streams or Channels
A stream flowing in several dividing and reuniting channels resembling the strands of a braid, the cause of division being the obstruction by sediment deposited by the stream.

Broadcast Burning
Burning of an area that has been clearcut to remove logging slash from the site. Broadcast burning is done to prepare sites for regeneration or improve wildlife habitat.

Brush Disposal
Cleanup and disposal of slash and other hazardous fuels within the forest or project areas.

Buffer
The Tongass Timber Reform Act requires that timber harvest be prohibited in an area no less than 100 feet of uncut timber in width on each side of all Class I streams and Class II streams which flow directly into Class I streams. This 100-foot area is known as a buffer.

Candidate Species
Those species of plant or animal which are under consideration (by US Fish and Wildlife Service and National Marine Fisheries Service) for listing as threatened or endangered but which are provided no statutory protection under the Endangered Species Act.

Canopy
See Overstory.

Capability
An evaluation of a resource's inherent potential for use.

Carrying Capacity
The maximum number of species that can be supported indefinitely by available resources in a given area.

Channel Types
The defining of stream sections based on watershed runoff, landform relief, and geology.

Class I, II, III, IV, and Non-streams
See Aquatic Habitat Management Units.

Clearcut
The harvesting in one cut of all trees on an area. The area harvested may be a patch, strip, or stand large enough to be mapped or recorded as a separate class in planning for sustained yield. Clearcut size on the Tongass National Forest is limited to 100 acres, except for specific conditions noted in the Alaska Regional Guide.

Climax
A community of plants and animals which is relatively stable over time and which represents the late stages of succession under the current climate and soil conditions.

Coarse Woody Debris
Any large piece of relatively stable woody material having a diameter of at least four inches and length greater than three feet that intrudes into the stream channel. Also called Large Organic Debris (LOD) and Large Woody Debris (LWD).

Code of Federal Regulations
A codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the Federal Government.

Commercial Fishery
Fish, shellfish, or other fishery resources taken or processed within a designated area for commercial purposes.

Commercial Forest Land (CFL)
Productive forest land that is producing or capable of producing continuous crops of industrial wood and is not withdrawn from timber utilization by statute or administrative regulation. This includes areas suitable for management and generally capable of producing in excess of 20 cubic feet per acre of annual growth or in excess of 8,000 board feet net volume per acre. It includes accessible and inaccessible areas.

Normal CFL: Timber that can be economically harvested with locally available logging systems. Composed of two categories:

> *Standard:* Timber that can be economically harvested with locally available logging systems, such as highlead or short-span skyline.
>
> *Special:* Timber that is in areas where special consideration is needed to portect other resources but can be harvested with locally available logging systems.

Non-standard CFL: Timber that cannot be harvested with locally available logging systems and would require the use of other logging systems such as helicopter or long-span skyline.

Commercial Thinning
Thinning a stand where the trees to be removed are large enough to sell.

Commodity
Resources with monetary (market) or commercial value; all resource products which are articles of commerce (e.g., timber and minerals).

Confluence
The point where two streams meet.

Connectivity
A measure of the extent that forest areas between or outside reserves provide habitat for breeding, feeding, dispersal, and movement.

Corridor
Connective links of certain types of vegetation between patches of suitable habitat which are necessary for certain species to facilitate movement of individuals between patches of suitable habitat. Also refers to transportation or utility right-of-way.

Cover
Refers to trees, shrubs, or other landscape features that allow an animal to partly or fully conceal itself.

Critical Habitat
Specific terrain within the geographical area occupied by threatened or endangered species. Physical and biological features that are essential to conservation of the species and which may require special management considerations or protection are found in these areas.

Crown
The tree canopy. The upper part of a tree or woody plant that carries the main branch system and foliage.

Cruise
Refers to the general activity of determining timber volume and quality, as opposed to a specific method.

Cultural Resources
Historic or prehistoric objects, sites, buildings, structures, etc. that result from past human activities.

Cumulative Effects
The impacts on the environment resulting from the addition of the incremental impacts of past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions occurring over time.

Cumulative Visual Disturbance
The percent of a viewshed's seen area in a disturbed condition at any point in time.

Current Timber Supply
Timber specified by the Forest Service that has not been rejected by the purchaser and that has undergone analysis under the National Environmental Policy Act.

Cutover
Areas harvested recently.

Debris Avalanche
The sudden movement downslope of the soil mantle; it occurs on steep slopes and is caused by the complete saturation of the soil from prolonged heavy rains.

Debris Flow
A general term for all types of rapid movement of debris downslope.

Debris Torrents
Landslides that occur as a result of debris; avalanche materials which either dam a channel temporarily or accumulate behind temporary obstructions such as logs and forest debris.

Deer Winter Range
Locations that provide food and shelter for Sitka black-tailed deer under moderately severe to severe winter conditions.

Degradation
The general lowering of the surface of the land by erosive processes, especially by the removal of material through erosion and transportation by flowing water.

Demographic
Pertaining to the study of the characteristics of human populations, such as size, growth, density, distribution, and vital statistics.

Developed Recreation
Recreation that requires facilities that, in turn, result in concentrated use of an area, such as campgrounds and ski areas. Facilities in these areas might include roads, parking lots, picnic tables, toilets, drinking water, ski lifts, and buildings. See also Dispersed Recreation.

Diameter at Breast Height (DBH)
The diameter of a tree measured 4 feet 6 inches from the ground.

Direct Employment
The jobs that are immediately associated with the long-term contract timber sale including for example logging sawmills and pulp mills.

Discounted Benefits
The sum of all benefits derived from the forest over the life of a project.

Discounted Costs
The sum of all costs incurred from the Project Area during the period of project implementation.

Discount Rate
The rate used to adjust future benefits or costs to their present value.

Dispersed Recreation
Recreational activities that are not confined to a specific place and are generally outside developed recreation sites. This includes activities such as scenic driving, hiking, backpacking, hunting, fishing, snowmobiling, horseback riding, cross-country skiing, and recreation in primitive environments. See also Developed recreation.

Distance Zone
Areas of landscapes denoted by specified distances from the observer (foreground, middleground, or background). Used as a frame of reference in which to discuss landscape characteristics or management activities.

Diversity
The distribution and abundance of different plant and animal communities and species within an area.

Down
A tree or portion of a tree that is dead and laying on the ground.

Draft Environmental Impact Statement (DEIS or Draft EIS)
A statement of environmental effects for a major Federal action which is released to the public and other agencies for comment and review prior to a final management decision. Required by Section 102 of the National Environmental Policy Act (NEPA).

Duff
Vegetative material covering the mineral soils in forests, including the fresh litter and well decomposed organic material and humus.

Eagle Nest Tree Buffer Zone
A 330-foot radius around eagle nest trees established in a Memorandum of Understanding between the U.S. Fish and Wildlife Service and the Forest Service.

Ecological Province
Twenty-one ecological subdivisions of Southeast Alaska that are identified by generally distinct ecological, physiographic, and biogeographic features. Plant and animal species composition, climate, and geology within each province are generally more similar within than among adjacent provinces. Historical events (such as glaciers and uplifting) are important to the nature of the province and to the barriers that distinguish each province.

Ecosystem
A community of organisms and its physical setting. An ecosystem, whether a fallen log or an entire watershed, includes resident organisms, non-living components such as soil nutrients, inputs such as rainfall, and outputs such as organisms that disperse to other ecosystems.

Effects
Effects may be ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historical, cultural, economic, or social and may be direct, indirect, or cumulative.

Direct Effects: Results of an action occurring when and where the action takes place.

Indirect Effects: Results of an action occurring at a location other than where the action takes place and/or later in time, but in the reasonably foreseeable future.

Cumulative Effects: See Cumulative Effects

Endangered Species
A species of plant or animal which is in danger of extinction throughout all or a significant portion of its range. Plant or animal species identified by the Secretary of the Interior as endangered in accordance with the 1973 Endangered Species Act (ESA). See also Threatened Species, Sensitive Species.

Endemic
Peculiar to a particular locality; indigenous.

Erosion
The wearing away of the land surface by running water, wind, ice, gravity, or other geological activities.

Escapement
Adult anadromous fish that escape from all causes of mortality (human-caused or natural) to return to streams to spawn.

Estuarine Fringe Habitat
A 1,000-foot zone around an estuary.

Estuary
For the purpose of this EIS process, estuary refers to the relatively flat intertidal and upland areas generally found at the heads of bays and mouths of streams. They are predominantly mud and grass flats and are unforested except for scattered spruce or cottonwood.

Even-aged Stand Management
Management that results in the creation of stands in which trees of essentially the same age grow together. Clearcut, shelterwood, and other tree-cutting methods produce even-aged stands. See also Uneven-aged Management.

Executive Order
An order issued by the President of the United States that has the force of law.

Existing Visual Condition (EVC)
The level of visual quality or condition presently occurring on the ground. The six existing visual condition categories are:

Type I: These areas appear to be untouched by human activities.

Type II: Areas in which changes in the landscape are not noticed by the average person unless pointed out.

Type III: Areas in which changes in the landscape are noticed by the average person but they do not attract attention. The natural appearance of the landscape still remains dominant.

Type IV: Areas in which changes in the landscape are easily noticed by the average person and may attract some attention. Although the change in landscape is noticeable it may resemble a natural disturbance.

Type V: Areas in which changes in the landscape are obvious to the average person. These changes appear to be major disturbances.

Type VI: Areas in which changes in the landscape are in glaring contrast to the natural landscape. The changes appear to be drastic disturbances.

Falldown
The difference between planned or scheduled harvest and that which is attained after implementation.

Fen
A tract of low, wet ground containing sedge peat, relatively rich in mineral salts, alkaline in reaction, and characterized by slowly flowing water. Unlike peatlands (commonly referred to as bogs or muskegs), fens contribute to stable stream flows, provide nutrient input to streams and often contribute to fish rearing habitat. See also Muskeg.

Final Environmental Impact Statement (FEIS or Final EIS)
The final version of the statement of environmental effects required for major federal actions under Section 102 of the National Environmental Policy Act. It is a revision of the Draft EIS to include public and agency responses. The decisionmaker chooses which alternative to select from the Final EIS, and subsequently issues a Record of Decision (ROD).

Fine
Minute particles of soil.

Fiscal year
The Federal Government's accounting period. October 1 through September 30; e.g., October 1, 1991 to September 30, 1992 = Fiscal Year 1992.

Fish Habitat
The aquatic environment and the immediately surrounding terrestrial environment that combined afford the necessary physical and biological support systems required by fish species during various life stages.

Floodplain
The lowland and relatively flat areas joining inland and coastal waters including debris cones and flood-prone areas of offshore islands; including at a minimum that area subject to a 1 percent (100-year recurrence) or greater chance of flooding in any given year.

Fluvial
Of or pertaining to streams and rivers.

Forage
To wander or go in search of food.

Forb
Any herbaceous plant that is not a grass or grass-like. Includes plants that are commonly called weeds or wildflowers.

Foreground
The stand of trees immediately adjacent to a scenic area, recreation facility, or forest highway; the area located less than 0.25 mile from the viewer. See also Background and Middleground.

Forest or Forest System Land
National Forest lands currently supporting or capable of supporting forests at a density of 10 percent crown closure or better. Includes all areas with forest cover, including old growth and second growth, and both commercial and noncommercial forest land.

Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA)
Amended in 1976 by the National Forest Management Act.

Forest Plan
The Tongass Land Management Revision (TLMP), signed in 1997. This is the 10-year land allocation plan for the Tongass National Forest that directs and coordinates planning, the daily uses, and the activities carried out within the forest.

Forested Habitat
All areas with forest cover. Used in this EIS to represent a general habitat zone.

Forested Wetland
A wetland whose vegetation is characterized by an overstory of trees that are 20 feet or taller.

Forest Supervisor
The Forest Service officer responsible for administering a single national forest.

Fragmentation
An element of biological diversity that describes the natural condition of habitats in terms of the size of discrete habitat blocks or patches, their distribution, the extent to which they are interconnected, and the effects of management on these natural conditions. Also the process of reducing the size and connectivity of stands within a forest.

Geographic Information System (GIS)
An information processing technology to input, store, manipulate, analyze, and display spatial and attribute data to support the decision-making process. It is a system of computer maps with corresponding site-specific information that can be electronically combined to provide reports and maps.

Glide Channel
Channel types that occur on lowlands and landforms and are mostly associated with bogs, marshes, or lakes.

Groundwater
Water within the earth that supplies wells and springs.

Group Selection
Small groups of trees up to 2 acres in size are harvested.

Guidelines
A preferred or advisable course of action or level of attainment designed to promote achievement of goals and objectives.

Habitat
The sum total of environmental conditions of a specific place that is occupied by an organism, population, or community of plants or animals.

Habitat Capability
An estimate of the number of healthy individuals of a species that a habitat can sustain.

Habitat Suitability Index (HSI)
A value assigned to a unit of land using a computerized model that relates vegetative and geographic characteristics (e.g. stand volume, proximity to a stream or cliff, slope, aspect, etc.) to the land unit's value for a particular wildlife species. Values range from 0 to 1, with 1 being the best. Habitat Capability Models (HCM) used to generate HSIs were developed by interagency teams of biologists using the best available information including research results and best professional judgment.

Heritage Resources
Also known as Cultural Resources. Historic or prehistoric objects, sites, buildings, structures, and their remains, resulting from past human activities.

Humus
Substance of organic origin that is fairly but not entirely resistant to further bacterial decay.

Hydrophyte
Plants typically found in wet habitats.

Important Subsistence Use Area
Important Subsistence Use Areas include the "most-reliable" and "most often hunted" categories from the Tongass Resource Use Cooperative Survey (TRUCS) and from subsistence survey data from ADF&G, the University of Alaska, and the Forest Service, Region 10. Important use areas include both intensive and extensive use areas for subsistence harvest of deer, furbearers, and salmon.

Inclusions
Soil types that are not delineated on soil resource inventory maps because they are too small (in area) to be mapped at the scale used in the inventory at any locale.

Indirect Employment
The jobs in service industries that are associated with the Long-Term Contract timber sale including for example suppliers of logging and milling equipment. See also Direct Employment.

Infrastructure
The facilities, utilities, and transportation systems needed to meet public and administrative needs.

Inoperable Timber
Timber that cannot be harvested by any proven method because of potential resource damage, extremely adverse economic considerations, or physical limitation.

Interception
The process by which precipitation is caught and held by foliage, twigs, and branches of trees, shrubs, and other vegetation, and lost by evaporation, never reaching the surface of the ground.

Interdisciplinary Team (IDT)
A group of people with different backgrounds assembled to research, analyze, and write a project EIS. The team is assembled out of recognition that no one scientific discipline is sufficiently broad enough to adequately analyze a proposed action and its alternatives.

Irretrievable Commitments
Loss of production or use of renewable natural resources for a period of time. For example, timber production from an area is irretrievably lost during the time an area is allocated to a no-harvest prescription; if the allocation is changed to

allow timber harvest, timber production can be resumed. The production lost is irretrievable, but not irreversible.

Irreversible Commitments
Decisions causing changes that cannot be reversed. For example, if a roadless area is allocated to allow timber harvest, and timber is actually harvested, that area cannot at a later time be allocated to wilderness. Once harvested, the ability of the area to meet wilderness criteria has been irreversibly lost. Often applies to nonrenewable resources such as minerals and cultural resources.

Issue
A point, matter, or section of public discussion of interest to be addressed or decided.

Karst
A type of typography that develops in areas underlain by soluble rocks, primarily limestones. Sinkholes, collapsed channels, vertical shafts, and caves are formed when the subsurface layer dissolves. Areas on which karst has developed are said to display "karst topography."

Knutsen-Vandenberg Act (KV)
An Act was passed by Congress in 1930 and amended in 1976 to provide for reforestation, resource protection, and improvement projects in timber sale areas from funds collected as a portion of the stumpage fee paid by the purchaser. Examples of such projects are stream bank stabilization, fish passage structures, and wildlife habitat improvement.

Landscape-level Diversity
A function of the spatial distribution of habitat types across a large area such as a Project Area or ecological province.

Landslides
The moderately rapid to rapid downslope movement of soil and rock materials that may or may not be water-saturated.

Land Use Designation (LUD)
A defined area of land specific to which management direction is applied.

Large Woody Debris (LWD)
Any large piece of relatively stable woody material having a diameter greater than 10 centimeters and a length greater than one meter that intrudes into the stream channel.

Logging Camp
A temporary facility established to house industry and Forest Service personnel while timber harvest occurs in the area.

Log Transfer Facility (LTF)
A facility that is used for transferring commercially harvested logs to and from a vessel or log raft or the formation of a log raft. It is wholly or partially

constructed in waters of the United States and siting and construction are regulated by the 1987 Amendments to the Clean Water Act. Formerly termed "terminal transfer facility."

MBF
A thousand board feet net sawlog and utility volume.

MMBF
A million board feet net sawlog and utility volume.

Management Indicator Species (MIS)
Species of vertebrates and invertebrates whose population changes are believed to best indicate the effects of land management. The following categories were used where appropriate: endangered and threatened plant and animal species identified on State and Federal lists; species with special habitat needs that may be influenced significantly by planned management programs; species commonly hunted, fished, or trapped; nongame species of special interest; additional plant or animal selected because their population changes are believed to indicate effects of management activities on other species of a major biological community or on water quality.

Management Prescriptions
Management practices and intensity selected and scheduled for application on a specific area (e.g., a land use designation) to attain multiple-use and other goals and objectives.

Marginal
Commercial forest land (CFL) areas that do not qualify as standard or special CFL since they are not operable under short-term (ten years or less) projections of accessibility and economic conditions.

Maritime Climate
Weather conditions controlled by an oceanic environment characterized by small annual temperature ranges and high precipitation.

Market Pond Value
Also known as pond log value. Selling value minus manufacturing costs. Pond log values are the price a timber buyer would pay for a log at the mill site.

Mass Failure
The downslope movement of a block or mass of soil. This usually occurs under conditions of high-soil moisture and does not include individual soil particles displaced as surface erosion.

Mass Movement Index (MMI)
Rating used to group soil map units that have similar properties with respect to the stability of natural slopes.

Mass Wasting
A general term for a variety of processes by which large masses of earth material are moved by gravity either slowly or quickly from one place to another. Also known as mass movement.

Memorandum of Understanding (MOU)
A legal agreement between the Forest Service and other agencies resulting from consultation between agencies that states specific measures the agencies will follow to accomplish a large or complex project. A MOU is not a fund obligating document.

Middleground
The visible terrain beyond the foreground where individual trees are still visible but do not stand out distinctly for the landscape; area located from 0.25 to 5 miles from the viewer. See also, Foreground and Background.

Mineral Soils
Soils consisting predominantly of, and having its properties determined by, mineral matter.

Minimum Viable Population
A population with the estimated numbers and distribution of reproduction individuals to maintain the population over time.

Mitigation
Measures designed to counteract environmental impacts or to make impacts less severe. These measures may include avoiding an impact by not taking a certain action or part of an action, minimizing an impact by limiting the degree or magnitude of an action and its implementation; rectifying the impact by repairing, rehabilitating, or restoring the affected environment; reducing or eliminating the impact over time by preservation and maintenance operations during he life of the action; or compensating for the impact by replacing or providing substitute resources or environments.

Mixed Conifer
In Southeast Alaska, mixed conifer stands usually consist of western hemlock, mountain hemlock, Alaska yellowcedar, Western redcedar, and Sitka spruce species. Shorepine may occasionally be present.

Model
A representation of reality used to describe, analyze, or understand a particular concept. A model may be a relatively simple qualitative description of a system or organization, or a highly abstract set of mathematical equations. A model has limits to its effectiveness and is used as one of several tools to analyze a problem.

Monitoring
A process of collecting information to evaluate whether or not objectives of a project and its mitigation plan are being realized. Monitoring can occur at

different levels: to confirm whether mitigation measures were carried out in the matter called for (Implementation Monitoring); to confirm whether mitigation measures were effective (Effectiveness Monitoring); or, to validate whether overall goals and objectives were appropriate (Validation Monitoring). Different levels call for different methods of monitoring.

Multiple-aged Stands
An intermediate form of stand structure between even and uneven-aged stands. These stands generally have two or three distinct tree canopy levels occurring within a single stand.

Multiple Entry
More than one stand or land treament activity during a rotation of a stand or area.

Multiple Use
The management of all the various renewable resources of the National Forest System to be used in the combination that will best met the needs of the American people.

Muskeg
In Southeast Alaska, a type of bog or fen that has developed over thousands of years in depressions or flat areas on gentle to steep slopes. Also called peatlands.

National Environmental Policy Act (NEPA)
An act, passed by Congress in 1969, that declared a national policy to encourage productive harmony between humans and their environment to promote efforts that will prevent or eliminate damage to the environment and the biosphere and stimulate the health and welfare of humans to enrich the understanding of the ecological systems and natural resources important to the nation and to establish a Council on Environmental Quality. This act requires the preparation of environmental impact statements for federal actions that are determined to be of major significance.

National Forest Management Act (NFMA)
A law passed in 1976 that amends the Forest and Rangeland Renewable Resources Planning Act that requires the preparation of forest plans, regional guides, and regulations to guide that development.

National Wild and Scenic River System
Rivers with outstanding scenic, recreational, geological, fish and wildlife, historic, cultural, or other similar values designated by Congress under the Wild and Scenic Rivers Act of 1968 and amended in 1986, for preservation of their free-flowing condition. May be classified and administered under one or more of the following categories: Wild, Scenic, and/or Recreational.

Net Sawlog Volume
Trees suitable in size and quality for producing logs that can be processed into lumber. In Southeast Alaska, depending on the market, the volume may be processed as pulp or lumber.

No Action Alternative
The most likely condition expected to exist in the future if current management direction were to continue unchanged.

Noncommercial Forest Land
Land with more than 10 percent cover of commercial forest tree species but not qualifying as commercial forest land (CFL).

Notice of Intent (NOI)
A notice printed in the Federal Register announcing that an EIS will be prepared. The NOI must describe the proposed action and possible alternatives, describe the agency's proposed scoping process, and provide a contact person for further information. The NOI for this project was submitted on March 1, 1990.

Objectives
The precise steps to be taken and the resources to be used in achieving goals.

Offering
A Forest Service specification of timber harvest units, subdivisions, roads, and other facilities and operations to meet the requirements of a timber sale contract.

Off-highway Vehicle (OHV)
Any vehicle that is restricted by law from operating on public roads for general motor vehicle traffic. Includes motorbikes, minibikes, trailbikes, snowmobiles, dunebuggies, all-terrain vehicles, and four-wheel drive, high clearance vehicles (FSM 2355.01). Sometimes referred to as Off-road vehicle or ORV.

Old-growth Forest
Ecosystems distinguished by the later stages of forest stand development that differs significantly from younger forests in structure, ecological function, and species composition. Old-growth forest is characterized by a patchy, multi-layered canopy; trees that represent many age classes; large trees that dominate the overstory, large standing dead (snags) or decadent trees; and higher accumulations of large down woody material. The structure and function of an old-growth ecosystem will be influenced by its stand size and landscape position and context.

Old-Growth Habitat
Wildlife habitat managed to maintain old-growth forest characteristics through the planning period.

Organic Soils
Soils that conain a high percentage (generally greater than 20 to 30 percent) of organic matter throughout the soil depth.

Overmature
The stage at which a tree declines in vigor and soundness, for example, past the period of rapid height growth.

Overstory
The portion of trees in a forest that forms the uppermost layer of foliage, usually formed by the tallest trees. Also called the canopy.

Partial Cutting
Method of harvesting trees (not clearcutting) where any number of live stems are left standing in any of various spatial patterns. Can include seed tree, shelterwood, or other methods.

Patch
A non-linear surface area differing in appearance from its surroundings.

Peak Flow
The highest discharge of water recorded over a specified period of time at a given stream location.

pH
The degree of acidity or alkalinity.

Planning Area
For the purpose of analyzing viable populations, the planning area is the ecological province.

Planning Record
A detailed, formal account of the planning process for an EIS. The record contains data, maps, reports, planning process information, and results of public participation in the planning process. The Planning Record documents the decisions and activities that resulted in the Final EIS. Planning records are available for public review upon request under the Freedom of Information Act.

Plant Association
Climax plant community type.

Plant Communities
Aggregations of living plants having mutual relationships among themselves and to their environment. More than one individual plant community.

Pleistocene
The epoch forming the first half of the Quatemary period, originating about one million years ago.

Pond Value
The delivered price of logs at the mill minus the cost to manufacture them into usable products.

Population Viability
Ability of a population to sustain itself.

Precommercial Thinning
The practice of removing some of the trees of less than marketable size from a stand in order to achieve various management objectives.

Present Net Value
The difference between benefits and costs associated with the alternatives.

Process Group
A combination of similar channel types based on major differences in landform, gradient, and channel shapes.

Productive Old Growth
Old-growth forest capable of producing at least 20 cubic feet of wood fiber per acre per year, or having greater than 8,000 board feet per acre.

Public Participation
Meetings, conferences, seminars, workshops, tours, written comments, responses to survey questionnaires, and similar activities designed and held to obtain comments from the public about Forest Service activities.

Record of Decision (ROD)
A document separate from but associated with an EIS that states the decision, identifies all alternatives, specifying which were environmentally preferable, and states whether all practicable means to avoid environmental harm from the alternatives have been adopted, and if not, why not.

Recreation Opportunity Spectrum (ROS)
The system for planning and managing recreation resources that categorizes recreation opportunities into six classes. Each class is defined in terms of the degree to which it satisfies certain recreation experience needs based on the extent to which the natural environment has been modified, the type of facilities provided, the degree of outdoor skill needed to enjoy the area, and the relative density of recreation use. The classes are:

Primitive: An essentially unmodified natural environment of fairly large size. Interaction between users is very low, and evidence of other users is minimal. The area is managed to be essentially free from evidence of human-induced restrictions and controls. Motorized use is generally not permitted.

Semi-Primitive Nonmotorized: A natural or natural-appearing environment of moderate to large size. Concentration of users is low, but there is often evidence of other users. The area is managed to minimize on-site controls and restrictions. Use of local roads for recreational purposes is not allowed.

Semi-Primitive Motorized: A natural or natural-appearing environment of moderate to large size. Interaction between users is low, but there is often evidence of other users. The area is managed to minimize on-site controls and restrictions. Local roads used for other resource management activities may be present.

Roaded Natural: A natural-appearing environment with moderate evidence of the sights and sounds of humans. Such evidence usually harmonizes with the natural environment. Interaction between users may be moderate to high with evidence of other users prevalent. Motorized use is allowed.

Roaded Modified: A natural environment that has been substantially modified particularly by vegetation manipulation. There is strong evidence of roads and/or highways. Frequency of contact is low to moderate.

Rural: A natural environment that has been substantially modified by development of structures and vegetative manipulation. Structures are readily apparent and may range from scattered to small dominant clusters. Sights and sounds of humans are readily evident, and the interaction between users is often moderate to high.

Reforestation
The natural or artificial restocking of an area with trees.

Regeneration
The process of establishing a new crop of trees on previously harvested land.

Region
An area covered by a Forest Service regional guide. A region is generally composed of one or more national forests. Forest Service Region 10 includes the Tongass National Forest and the Chugach National Forest.

Regional Forester
The Forest Service official responsible for administering a single region.

Regional Guide
The guide developed to meet the requirements of the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended. It guides all natural resource management activities and establishes management standards and guidelines for the National Forest System lands within a given report.

Rehabilitation
Actions taken to protect or enhance site productivity, water quality, or other values for a short period of time.

Reserved
Lands that have been withdrawn from the timber base by an Act of Congress, the Secretary of Agriculture, or the Chief of the Forest Service.

Reserve Trees
Merchantable or submerchantable trees and snags that are left within the harvest unit to provide biological habitat components over the next management cycle.

Resident Fish
Fish that are not anadromous and that reside in fresh water on a permanent basis. Resident fish include non-anadromous Dolly Varden char and cutthroat trout.

Resource Values
The tangible and intangible worth of forest resources.

Responsible Official
The Forest Service employee who has the delegated authority to make a specific decision.

Retention
A visual quality objective which provides for management activities that are not visually evident to the casual observer.

Revegetation
The re-establishment and development of a plant cover. This may take place naturally through the reproductive processes of the existing flora or artificially through the direct action of reforestation or reseeding.

Riparian Area
Transition zone between a stream or lake system and the adjacent land. Identified in part by soil characteristics or distinctive plant communities that require free or unbound water.

Riparian Ecosystems
A transition between the aquatic ecosystem and the adjacent terrestrial ecosystem; identified by soil characteristics or distinctive vegetation communities that require free or unbound water.

Riparian Management Area
Land areas delineated in the Forest Plan to provide for the management of riparian resources. Specific standards and guidelines, by stream process group, are associated with riparian management areas. Riparian management areas may be modified by watershed analysis.

Road Maintenance Level
The level of service provided by, and maintenance required for, a specific road consistent with road management objectives and maintenance criteria (FSH 7709.58, Section 12.3).

Maintenance Level 1: Assigned to intermittent service roads during the time they are closed to vehicular traffic. The closure period is one year or longer. Basic custodial maintenance is performed.

Maintenance Level 2: Assigned to roads open for use by high-clearance vehicles. Passenger car traffic is not a consideration.

Maintenance Level 3: Assigned to roads open and maintained for travel by the prudent driver in a standard passenger car. User comfort and convenience are not considered priorities.

Maintenance Level 4: Assigned to roads that provide a moderate degree to user comfort and convenience at moderate travel speeds.

Maintenance Level 5: Assigned to roads that provide a high degree of user comfort and convenience. Normally, roads are double-laned and paved, or aggregate surfaced with dust abatement.

Road Management Objective (RMO)
Defines the intended purpose of an individual road based on Management Area direction and access management objectives. RMOs contain design criteria, operation criteria and maintenance criteria. Long-term and short-term roads have RMOs.

Roads
Specified: Roads usually developed and operated for long-term land and resource management purposes to constant service.

Temporary: For National Forest timber sales, temporary roads are constructed to harvest timber on a one-time basis. These logging roads are not considered part of the permanent Forest transportation network and have stream crossing structures removed, erosion measures put into place, and the road closed to vehicular traffic after harvest is completed.

Roadless Area
An area of undeveloped public land identified in the roadless area inventory of the 1997 TLMP within which there are no improved roads maintained for travel by means of motorized vehicles intended for highway use.

Rotation
The planned number of years (approximately 100 years in Alaska) between the time that a forest stand is regenerated and its next cutting at a specified stage of maturity.

Salvage Cutting
Cutting primarily to utilize dead/down material resulting from windthrow and scattered poor-risk trees that will not be marketable if left in the stand until the next scheduled harvest.

Salvage Sale
A timber sale to use dead and downed timber and scattered poor-risk trees that would not be marketable if left in the stand until the next scheduled harvest. Salvage sales must contain more than 50 percent by volume of dead, insect infested, or windthrown timber.

Sawlog
That portion of a tree that is suitable in size and quality for the production of dimension lumber, collectively known as sawtimber.

Scheduled Timber Harvests
Timber harvests done as part of meeting the allowable sale quantity.

Scoping Process
Early and open activities used to determine the scope and significance of a proposed action, what level of analysis is required, what data is needed, and what level of public participation is appropriate. Scoping focuses on the issues surrounding the proposed action and the range of actions, alternatives, and impacts to be considered in an EA or an EIS.

Scrub-Shrub Wetland
Wetland dominated by woody vegetation less than 20 feet tall. The species include true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions. In Southeast Alaska, this includes forested lands where trees are stunted because of poor soil drainage.

Second-growth Forest
Forest growth that has become established following some disturbance such as cutting serious fire, or insect attack; even-aged stands that will grow back on a site after removal of the previous timber stand.

Sediment
Solid material, both mineral and organic, that is in suspension, is being transported, or has been moved from its site of origin by air, water, gravity, or ice and has come to rest on the earth's surface.

Seedling/Sapling Stage
The stage following timber harvest when most of the colonizing tree and shrub seedlings become established. Usually 1 to 25 years.

Selection Cutting
A silvicultural system used to create or maintain uneven-aged stands, usually by the periodic removal of groups of trees or individual trees. It is undertaken to provide periodic harvests while maintaining full residual stand growth rates. It attempts to develop a balanced uneven-aged stand structure, including the encouragement of regeneration by providing the cultural measures needed for tree growth and seedling establishment.

Sensitive Species
Plant and animal species which are susceptible or vulnerable to activity impacts or habitat alterations. Those species that have appeared in the Federal Register as proposed for classification or are under consideration for official listing as endangered or threatened species, that are on a nonofficial State list, or that are recognized by the regional forester as needing special management on National Forest System lands to prevent placement on Federal or State lists.

Sensitivity level
The measure of people's concern for the scenic quality of the National Forests. In 1980, the Tongass National Forest assigned sensitivity levels to land areas viewed from boat routes and anchorages, plane routes, roads trails, public use areas, and recreation cabins.

Level I: Includes all seen areas from primary travel routes use areas and water bodies where at least three-fourths of the forest visitors have a major concern for scenic quality

Level II: Includes all seen areas from primary travel routes, use areas, and water bodies where at least one-fourth of the forest visitors have a major concern for scenic quality.

Level III: Includes all seen areas from secondary travel routes, use areas, and water bodies where less than one-fourth of the forest visitors have a major concern for scenic quality.

Seral
Early stage of succession.

Shade Tolerance
Tree species that have physiological growth processes adapted to shaded environments. Western hemlock is a shade tolerant species. Other tree species tolerance to shade may range from tolerant to intolerant.

Significant
Specific legal term under the National Environmental Policy Act (NEPA) that requires considerations of both context and intensity in evaluating impacts.

Silvical Characteristics
Physiological and genetic characteristics of individual tree species and the ecological characteristics (biological and environmental factors) of the site which enable a specific species to be adapted to a particular and unique site.

Silvicultural Prescription
A written technical document which provides detailed implementation direction about methods, techniques, timing, and monitoring or vegetative treatments. A prescription is prepared after a preferred treatment alternative has been selected, but before the project is implemented. A prescription is prepared by a silviculturist who uses interdisciplinary input to best achieve established objectives, direction, and requirements for land managed by the USDA Forest Service.

Silviculture
The art, science and practice of controlling the establishment, composition, structure and growth of trees and other vegetation in forest stands.

Silviculture Practices
Management techniques used to modify, manage and replace a forest over time. Silvicultural practices are classified according to the method of carrying out the process (shelterwood, seed tree, clearcut, commercial thinning, etc.).

Site Index
A measure of a forest area's relative productive capacity for tree growth. Measurement of site index is based on height of dominant trees in a stand at a given age.

Site Preparation
Manipulation of the vegetation or soil of an area prior to planting or seeding. The manipulation follows harvest, wildfire, or construction in order to encourage the growth of favored species. Site preparation may include applying herbicides, burning, or cutting living vegetation that competes with the favored species; tilling the soil; or burning organic debris (usually logging slash) that makes planting or seeding difficult.

Site Productivity
Production capability of specific areas of land.

Slash
Debris left over after a logging operation (i.e., limbs, bark, broken pieces of logs).

Smolt
A juvenile salmon, trout, or Dolly Varden migrating to the ocean and undergoing physiological changes to adapt its body from a freshwater to a saltwater environment.

Snag
A standing dead tree, usually greater than 5 feet tall and 6 inches in diameter at breast height.

Soil Productivity
Capacity of soil to produce plant growth due to the soil's chemical, physical, and biological properties.

Soil Resource Inventory (SRI)
An inventory of the soil resource based on landform, vegetative characteristics, soil characteristics, and management potentials.

Soil Texture
Relative amounts of sand, silt, and clay in a soil. Coarse-textured soils are generally considered sandy and often contain gravel of various sizes. Fine-textured soils are considered very fine, sandy, silty, or clay.

Spawning Area
The available area in a stream course which is suitable for the deposition and incubation of salmon or trout eggs.

Special Habitats
Structural elements of ecosystems. These may include, but are not limited to: snags, spawning gravels, fallen trees, aquatic reefs, caves, seeps, and springs.

Special Use Permit
Permits and granting of easements (excluding road permits and highway easements) authorizing the occupancy and use of land.

Species Diversity
The number of different species occurring in a location or under a similar environmental condition.

Split Yarding
The process of separating the direction of timber harvest yarding into opposite directions.

Stand (Tree Stand)
A group of trees occupying a specific area and sufficiently uniform in composition, age arrangement, and condition as to be distinguishable from the forest in adjoining areas.

Standard
A course of action or level of attainment required by the Forest Plan to promote achievement of goals and objectives.

Stand-level Diversity
The diversity within specific habitats or limited land areas as measured by number of species present (species richness) or structural complexity of a given habitat type.

State Historic Preservation Officer (SHPO)
State appointed official who administers Federal and State programs for cultural resources.

State Selection
Application by Alaska Department of Natural Resources (ADNR) to the Bureau of Land Management for conveyance of a portion of the 400,000-acre State entitlement from vacant and unappropriated National Forest System lands in Alaska under the Alaska Statehood Act.

Stocking
The degree of occupancy of land by trees as measured by basal area or number of trees and as compared to a stocking standard; that is, the basal area or number of trees required to fully use the growth potential of the land.

Stream Classes
See Aquatic Habitat Management Unit.

Structural Diversity
The diversity of forest structure, both vertically and horizontally, which provides for variety of forest habitats such as logs and multi-layered forest canopy for plants and animals.

Stumpage
The value of timber as it stands uncut in terms of dollar value per thousand board feet.

Subsistence Use
The customary and traditional uses by rural Alaskan residents of wild renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation; for the making and selling of handicraft articles out of nonedible byproducts of fish and wildlife resources taken for personal or family consumption; for barter or sharing, for personal or family consumption; and for customary trade.

Subsistence Use Area
Important Subsistence use areas include the "most reliable" and "most often hunted" categories from the Tongass Resource Use Cooperative Survey (TRUCS) and from subsistence survey data from ADF&G, the University of Alaska, and the Forest Service Region 10. Important use areas include both intensive and extensive use areas for subsistence harvest of deer, furbearers, and salmon.

Substantive Comment
A public comment that provides factual information, professional opinion, or informed judgment germane to the action being proposed.

Substrate
The type of material in the bed (bottom) of rivers and streams.

Succession
The ecological progression of community change over time, characterized by displacements of species leading to a relatively stable climax community.

Suitability
An evaluation based upon a resource's potential use within proposed management activities.

Suitable Forestland
Commercial forestland identified as having both the biological capability and availability to produce industrial wood products.

Sustained Yield
The amount of renewable resources that can be produced continuously at a given intensity of management.

Swale
A slight, marshy depression in generally level land. A depression in glacial ground moraine.

Temporary Roads
See Roads.

Tentatively Suitable Forestland
Forest land that is producing or is capable of producing crops of industrial wood and (a) has not been withdrawn by Congress, the Secretary of Agriculture or the Chief of the Forest Service; (b) existing technology and knowledge is available to ensure timber production without irreversible damage to soils productivity or watershed conditions; (c) existing technology and knowledge, as reflected in current research and experience, provides reasonable assurance that it is possible to restock adequately within 5 years after final harvest; and (d) adequate information is available to project responses to timber management activities.

Thinning
The practice of removing some of the trees in a stand so that the remaining trees will grow faster due to reduced competition for nutrients, water, and sunlight. Thinning may also be done to change the characteristics of a stand for wildlife or other purposes. Precommercial and commercial thinning may be done at two different stages.

Third Order Watershed
A watershed that contains a third order stream segment.

Threatened Species
A species of plant or animal likely to become endangered within the foreseeable future throughout all or a significant portion of its range, as defined in the Endangered Species Act of 1973, and which has been designated in the Federal Register by the Secretary of the Interior as a threatened species. See also Endangered Species, Sensitive Species.

Threshold
The point or level of activity beyond which an undesirable set of responses begins to take place within a given resource system.

Tiering
Eliminating repetitive discussion of the same issue by incorporating by reference. The general discussion in an EIS of broader scope (e.g., this document is tiered to TLMP, as amended).

Timber Appraisal
Establishing the fair market value of timber by taking the selling value minus manufacturing costs, the cost of getting logs from the stump to the manufacturer, and an allowance for profit and risk.

Timber Classification
Forested land is classified under each of the land management alternatives according to how it relates to be management of the timber resource. The following are definitions of timber classification used for this purpose:

Nonforest: Land that has never supported forests and land formerly forested where use for timber production is precluded by development for other uses.

Forest: Land at least 10-percent stocked (based on crown cover) by forest trees of any size, or formerly having had such tree cover and not currently developed for nonforest use.

Suitable or suitable available: Land to be managed for timber production on a regulated basis.

Unsuitable: Forest land withdrawn from timber utilization by statute or administrative regulation (for example, wilderness), or identified as inappropriate for timber production in the Forest planning process.

Commercial forest: Forest land tentatively suitable for the production of continuous crops of timber and that has not been withdrawn.

Timber Entry
A term used to refer to how far into the timber rotation an area is on the basis of acreage harvested. For example, if an area is being managed for 3 entries over a 100-year rotation, the first entry would be completed when one-third (approximately 33 percent) of the available acreage is harvested (usually in 30-40 years); the second entry would be completed when two-thirds (approximately 66 percent) of the available acreage is harvested (usually 60-70 years); the third entry would be completed when all of the available acreage is harvested (at the end of the rotation).

Timber Harvest Unit
An area within which Forest Service specifies for harvest all or part of the timber.

Timber Production
The purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use.

Tongass Land Management Plan (TLMP)
The 10-year land allocation plan for the Tongass National Forest that directs and coordinates planning and the daily uses and activities carried out within the forest signed in 1997.

Tongass Resource Use Cooperative Survey (TRUCS)
A compilation of data on subsistence uses for evaluating the effects of the proposed action in this EIS.

Traffic Service Levels
Traffic characteristics and operating conditions that are used in setting road maintenance levels.

Turbidity
An indicator of the amount of suspended sediments in water.

Understory
The trees and shrubs in a forest growing under the main crown canopy or overstory.

Uneven-aged Management
The application of a combination of actions needed to simultaneously maintain continuous high-forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of diameter or age classes to provide a sustained yield of forest products. Cutting is usually regulated by specifying the number or proportion of trees of particular size to retain within each area, thereby maintaining a planned distribution of size classes.

Unsuitable
Forest land withdrawn from timber utilization by statute or administrative regulation (e.g., wilderness), or identified as not appropriate for timber production in the forest planning process.

Utility Logs
Those logs that do not meet sawlog grade but are suitable for production of firm usable pulp chips.

Value Comparison Unit (VCU)
Areas which generally encompass a drainage basin containing one or more large stream systems; boundaries usually follow easily recognizable watershed divides. Established to provide a common set of areas where resource inventories could be conducted and resource interpretations made.

Viable Population
The number of individuals in a species required to ensure the continued long-term existence of the population in natural, self-sustaining populations and adequately distributed throughout the region.

Viewshed
An expansive landscape or panoramic vista seen from a road, marine waterway, or specific viewpoint.

Visual Absorption Capability (VAC)
An estimate of the relative ability of a landscape to absorb alteration yet retain its visual integrity.

Visual Quality Objective (VQO)
Measurable standards reflecting five different degrees of landscape alteration based upon a landscape's diversity of natural features and the public's concern for high scenic quality. The five categories of VQOs are:

Preservation: Permits ecological changes only. Applies to wilderness areas and other special classified areas.

Retention: Provides for management activities that are not visually evident; requires reduction of contrast through mitigation measures either during or immediately after operation.

Partial Retention: Management activities remain visually subordinate to the natural landscape. Mitigation measures should be accomplished within one year of project completion.

Modification: Management activities may visually dominate the characteristics landscape. However activities must borrow from naturally established form line color and texture so that its visual characteristics resemble natural occurrences within the surrounding area when viewed in the middleground distance.

Maximum Modification: Management activities may dominate the landscape. Mitigation measures should be accomplished within five years of project completion.

V-notch
A deeply cut valley along some waterways, generally in steep, mountainous terrain, that would look like a "V" from a frontal view.

Volume
Stand volume based on standing net board feet per acre by Scribner Rule.

Volume Strata
Divisions of old-growth timber volume derived from the interpreted timber type data layer (TIMTYP) and the common land unit data layer (CLU). Three volume strata (low, medium, and high) are recognized in the Forest Plan for each Administrative Area.

Watershed
That area that contributes water to a drainage or stream; portion of a forest in which all surface water drains to a common point. Can range from a few tens of acres that drain a single small intermittent stream to many thousands of acres for a stream that drains hundreds of connected intermittent and perennial streams.

Wetland
Areas that are inundated by surface or groundwater frequently enough to support vegetation that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflows, mudflats, and natural ponds.

Wilderness
Areas designated under the 1964 Wilderness Act. Wilderness is defined as undeveloped federal land retaining its primeval character and influence without permanent improvements or human habitation. Wilderness areas are protected and managed to preserve their natural conditions, which generally appear to have been affected primarily by the forces of nature, with the imprint of human activity substantially unnoticeable; have outstanding opportunities for solitude or

primitive and unconfined type of recreation; areas of at lease 5,000 acres are of sufficient size to make practical their preservation, enjoyment, and use in an unimpaired condition; and may contain features of scientific, educational, scenic, or historical value as well as ecologic and geologic interest. In Alaska, wilderness also has been designated by Tongass Timber Reform Act (TTRA) and ANILCA.

Wildlife Analysis Area (WAA)
Alaska Department of Fish and Game (ADF&G) administrative designation of an area that includes one or several Value Comparison Units (VCUs) for wildlife analysis and regulating wildlife populations.

Wildlife Habitat
The locality where a species may be found and where the essentials for its development and sustained existence are obtained.

Wildlife Habitat Management Unit (WHMU)
An area of wildlife habitat identified during the Interdisciplinary team (IDT) process as having values important to wildlife.

Windfirm
Configuration of harvest units so as not to create an opening which exposes the adjacent stand of timber to the direction of the major prevailing storm wind (southeast).

Windthrow
The act of trees being uprooted, blown down, or broken off by storm winds. Three types of windthrow include: endemic where individual trees are blown over, catastrophic where a major windstorm can destroy hundreds of acres, and management related where the clearing of trees in an area makes the adjacent standing trees vulnerable to windthrow.

Winter Range
An area, usually at lower elevation, used by big game during the winter months.

Withdrawal
The withholding of an area of Federal land from settlement, sale, location, or entry under some or all of the general land laws of the purposes of limiting activities under those laws to maintain other public values in the area.

Yarding
Hauling timber from the stump to a collection point.

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Appendix A

Reasons for Scheduling This Environmental Analysis

APPENDIX A
REASONS FOR SCHEDULING THE ENVIRONMENTAL ANALYSIS OF SKIPPING COW TIMBER SALE

This appendix provides a detailed explanation of the rationale for a specific timber sale project and its importance to the multi-year timber program on the Tongass National Forest. To accomplish this, the following questions are answered:

- **Why is Timber from the Tongass National Forest Being Offered for Sale?**
- **What Steps Must Be Completed to Prepare a Sale for Offer?**
- **How does the Forest Service Develop Expectations about the Market Demand for Timber?**
- **How does the Forest Service Maintain an Orderly and Predictable Timber Sale Program?**
- **How Does the Forest Service Decide Where Timber Sale Projects Should be Located?**
- **How Does This Project Fit into the Tongass Timber Program?**
- **Why Can't This Project Be Located Somewhere Else?**

Coordinated timber sale planning is essential for meeting the goals of the Tongass Land Management Plan and to provide an orderly flow of timber to local industry. To determine the volume of timber to offer each year, the Forest Service can look to current market conditions and the level of industry operations. However, the lengthy planning process—of which this document is a part—requires the Forest Service to rely on projections of future harvest levels to decide how many timber sale projects to begin each year. This document explains how the Forest Service uses information about future markets and past experience with the logistics of timber sale planning to determine the volume of timber that needs to be started through this process each year. Using a detailed timber sale schedule that provides information about each sale as it moves through each stage of the planning process, this appendix explains the rationale and the necessity for completing this particular timber sale project at this point in time.

Why is Timber from the Tongass National Forest Being Offered for Sale?

National Legislation

On a national level, the legislative record is very clear about the role of the timber program in the multiple-use mandate of the National Forests. The Organic Act of 1897, 16 USC 473-481 (partially repealed in 1976) directed the agency to manage the forests in order to "improve and protect the forest ... [and] for the purpose of securing favorable conditions of water flows, and to *furnish a continuous supply of timber* for the use and necessities of the citizens of the United States" (emphasis added.) The Multiple-Use Sustained Yield Act of 1960, 16 U.S.C. 528-531, directs the Forest Service to administer federal lands for "outdoor recreation, range, timber, watershed, and wildlife and fish purposes."

The National Forest Management Act of 1976 (NFMA) (16 U.S.C. 472a) states that "the Secretary of Agriculture...[may sell , at not less than appraised value, trees, portions of trees, or forest products located on National Forest System Lands." Although the heart of the Act is land management planning, the Act also sets policy direction for timber management and public participation in Forest Service decision making. Under NFMA, the Forest Service was directed to "limit the sale of timber from each national forest to a quantity equal to or less than a quantity which can be removed from such forest annually in perpetuity on a sustained-yield basis" (16 U.S.C. 1611).

The NFMA directed the Forest Service to complete land management plans for all units of the National Forest System. Forest Plans were to be developed by an interdisciplinary team to provide for the coordination of outdoor recreation, range, timber, watershed, wildlife and fish, and wilderness. The 1979 Tongass National Forest Land and Resource Management Plan was the first to be completed. A revised Forest Plan was issued in 1997. With regard to timber production, the Record of Decision (ROD) for the 1997 Plan stated:

> The Tongass National Forest will continue to allow timber harvest while maintaining sustained yield and multiple use goals…Although the maximum amount of timber that could be harvested during the first decade of the Revised Plan implementation is an average of 267 MMBF per year, a level of 200 million board feet (MMBF) or less is more likely to be offered over the next few years, given current market conditions and the transition that both the timber industry and the Forest Service is experiencing. Therefore, the public can expect the amount of timber to be offered annually to vary between 200 MMBF or less and 267 MMBF.
>
> …The timber resource will be managed for production of sawtimber and other wood products from timberlands available for sustainable timber harvest, on an even-flow, sustained-yield basis and in an economically efficient manner. We will seek to provide a timber supply sufficient to meet the annual market demand for Tongass National Forest timber and the market demand for the planning cycle…

In April 1999, Under Secretary Jim Lyons elected to modify the 1997 Plan and issue a new ROD. As stated in the 1999 ROD:

> The Tongass National Forest will continue timber harvest consistent with sustained yield and multiple use goals. The forest-wide standards and guidelines for timber include general direction to "[e]nsure that silvicultural systems other than clearcutting are considered through an appropriate project level analysis process. However, uneven-aged management systems will be limited to areas where yarding equipment suited to selective logging can be used"…
>
> Forest-wide, considering all land allocations where timber harvest is permitted, it is estimated that 65 percent of harvesting will involve clearcutting, with the remaining 35 percent utilizing other methods.
>
> …the ASQ for the next 10 years on the Tongass is reduced from an estimated average annual level of 267 MMBF in the 1997 ROD to 187 MMBF in the 1999 ROD, considering both Non-Interchangeable Component (NIC) I and NIC II. Although initially this would seem to be a significant reduction in the allowable sale quantity (ASQ), this ceiling for timber harvests from the Tongass remains sufficient to meet all but the most optimistic projections for timber demand and harvests from the Forest for the next decade. I believe that the additional environmental and multiple use benefits provided by this decision should not result in negative social and economic impacts based upon the most current demand for timber.

In day to day operation of the Tongass timber program, the Forest Service attempts to strike a balance among timber availability as documented in the Forest Plan, the market demand for timber in Southeast Alaska, the needs and desires of other forest users, and funding allocations made by Congress.

Alaska-Specific Legislation

Legislation unique to Alaska also directs the Forest Service to maintain a commercial timber program. The Alaska National Interest Lands Conservation Act (ANILCA; P.L. 96-487, 1980) and the Tongass Timber Reform Act (TTRA; P.L. 101-625, 1990) speak directly to the issue of Tongass timber supply. Section 705(a) of ANILCA directed the Forest Service to maintain a timber supply from the Tongass at a rate of four billion five hundred million board feet per decade. To ensure that the timber target was met, Congress provided for a $40 million annual earmark to fund pre-roading, cultural treatments and innovated logging systems.

Section 101 of TTRA repealed the timber supply mandate and fixed appropriations of ANILCA and replaced them with the following more general direction:

> Sec. 705. (a), Subject to appropriations, other applicable law, and the requirements of the National Forest Management Act (P.L. 94-588); except as provided in subsection 9d) of this section, the Secretary shall, to the extent consistent with providing for the multiple use and sustained yield of all renewable forest resources, seek to provide a supply of timber from the Tongass National Forest which (1) meets the annual market demand for timber from such forest and (2) meets the annual market demand from such forest for each planning cycle.

Timber from the Tongass National Forest is being offered as part of the multiple use mission of the Forest Service as identified in public laws. Alaska-specific legislation and the Forest Plan directs the Forest Service to seek to provide timber to meet market demand subject to appropriations and balancing of forest uses.

What Steps Must Be Completed to Prepare a Sale for Offer?

The timber sale program is complex. A number of projects are underway at any given point in time, each of which may be in a different stage of planning and preparation. A system of checkpoints, or "gates", helps the Forest Service track the significant milestones of each project from inception to contract termination, followed by monitoring, reforestation, and timber stand improvement. Each project passes through all of the following gates, with the complexity of the sale determining the complexity of the final product at each stage.

Gate 1: Completion of Position Statement. The Position Statement is a brief analysis of the project area with the intent of determining the feasibility of the potential timber sale. This is the first step in the timber sale planning process and it is usually completed from seven to ten years before a sale is offered. After the Position Statement is developed, the Forest Service decides whether to continue to the next phase of the project where a significant investment in time and money will be made.

Gate 2: Sale Area Design, Environmental Documentation and Decision. This phase of the project is commonly referred to as the "NEPA" phase and includes inventory, public scoping, analysis, draft disclosure of the effects of the project on the environment, public comment, final analysis and disclosure, decision, potential appeal, and litigation. Gate 2 activities are generally completed two to six years before a sale is offered. The end product of this phase, an environmental decision document, forms the starting point for the next phase.

Gate 3: Plan Implementation and Field Layout. Gate 3 activities are typically completed one

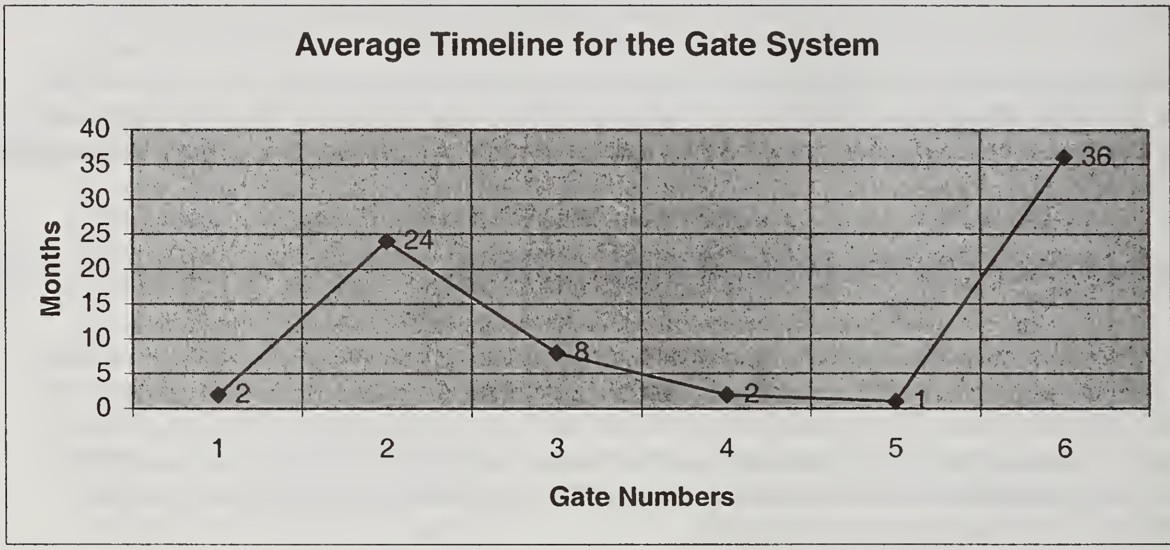
to three years before a sale is offered. During this phase, the information and direction included in the decision document (Gate 2) is used to designate the actual project on the ground. Additional site-specific information is collected at this time.

Gate 4: Appraisal Offering Package. The costs and value associated with the timber sale designed in Gate 3 are computed and packaged in a timber sale contract. The contract tells the prospective timber sale purchaser how the sale must be harvested to be in conformance to the project decision document. This phase of the Gate system occurs during the final year of the project development and culminates with the advertisement of the project for sale.

Gate 5: Bid Opening. Gate 5 is completed with the opening of bids for the project. If a bid is submitted, contractual provisions govern when the award of the sale takes place and when the sale will be completed and how timber removal is to occur.

Gate 6: Award. Gate 6 is the formal designation of a contract between a bidder and the Forest Service.

Figure 1. Average Timeline for the Gate System



How does the Forest Service Develop Expectations about Future Timber Markets?

The Tongass National Forest makes two determinations on volume to be offered. The first is a determination on volume to be offered for the current year (annual market demand). The annual market demand is analogous to assessing industry performance in the short-term. In the short-run a firm will make use of its existing equipment to maximize profits or minimize losses. The general approach is to consider the timber requirements of the region's sawmills at different levels of operation and under different assumptions about market conditions and technical processing capability. These assumptions provide a basis for estimating the volume of timber likely to be processed by the industry as a whole in any given year. Timber inventory requirements are acknowledged and estimated in a related calculation. The volume of timber likely to be purchased is equal to the volume needed to make up any inventory shortfall in addition to the volume likely to be harvested in the coming year. The document titled *Evaluating the Demand for Tongass Timber* (USDA, Forest Service, R-10; Morse; September 28, 1998) forms the basis for how these estimates are developed. The document titled *Tongass Timber Sale*

Procedures (USDA, Forest Service, R-10; Morse, Draft August 30, 1999) documents actual estimates for the current year. This estimate is what the Tongass plans to offer for the current year of the Ten Year Timber Sale Schedule pending sufficient funding to do so.

Based on the analysis documented in *Tongass Timber Sale Procedures*, for Fiscal Year 2000, the Tongass National Forest plans to offer approximately 148 MMBF for sale. The sales planned for offer will be a combination of new, previously offered, or previously offered and reconfigured. Both standing timber and salvage will be components of the program. Offerings will consist of those targeted for Small Business qualified firms as well as a portion of the volume being made available for the open market.

Life of the Forest Plan (Market Demand over the Planning Cycle)

Given the long time involved in preparing a timber sale, the proposed timber sales in this document may not be harvested for 3 to 4 years or longer, not including appeals or litigation. The Forest Service needs some idea of what the long run timber demand will be given cycles in the market. On average what should the Forest Service plan for offer, given that timber from this National Environmental Policy Act (NEPA) document may not be harvested for 4 years into the future? The Forest Service needs to take a long-run view for planning purposes. To answer these questions the Forest Service asked the Pacific Northwest Research Station for professional assistance.

As the Tongass Land Management Plan was being revised in 1997, research economists at the Pacific Northwest Research Station (PNW) were asked to update their earlier projections of Alaska timber products output and timber harvest by ownership. The most recent projections of timber harvest over the planning cycle account for several dramatic changes in the region's manufacturing capabilities, increased competition from a number of sources, and the steady erosion of North America's share of Japanese timber markets.

The Tongass documents these projections and the means of implementation through the issuance of a Ten Year Timber Sale Schedule. Each year this plan is updated whereby the current year is dropped at the culmination of the fiscal year and a new year ten is added. The basis for this schedule is long range timber market projections documented in the publication titled *Timber Products Output and Timber Harvest in Alaska: Projections for FY97-10* (Brooks and Haynes; PNW-GTR-409, September, 1997). These projections of Alaska timber products output, the derived demand for raw material, and timber harvest by owner are developed from a trend-based analysis. These projections reflect the consequences of recent changes in the Alaska forest sector and long-term trends in markets for Alaska products. With the closure of the two southeast Alaska pulp mills, demand for Alaska National Forest timber now depends on markets for sawn wood and the ability to export manufacturing residues and lower grade logs. Three alternative projections are used to display a range of possible future demand (Table 1). Areas of uncertainty include the prospect of continuing changes in markets and in conditions faced by competitors and the speed and magnitude in investment in manufacturing in Alaska.

Demand projections are important for program planning. They provide important guidance to the Forest Service for requesting budgets, for making decisions about workforce and facilities, and for indicating the need to begin new NEPA analysis for future program offerings. They also provide a basis for expectations regarding future harvest, and thus provide an important source of information for establishing the schedule of probable future sale offerings. The weight given to the projections will vary depending on a number of factors, such as how recently they were done, and how well they appear to have accounted for recent, site-specific events in the timber market.

Table 1. Projected National Forest Harvest

For Fiscal Year 2001-2009, the Tongass National Forest plans to schedule approximately 160 MMBF for sale each year over the life of the Forest Plan. This schedule is based on the projections documented in *Timber Products Output and Timber Harvest in Alaska: Projections for FY97-10* (Brooks and Haynes; PNW-GTR-409, September, 1997), and current volumes in the timber sale pipeline process. Prior to the beginning of Fiscal Year 2001 the amount of volume scheduled in outyears will once again be analyzed to determine if projections made now meet the anticipated needs in the future.

Fiscal Year	Projected Harvest (MMBF)		
	Low	Medium	High
2000	95.5	116.6	142.7
2001	104.6	129.0	157.7
2002	113.7	134.9	173.1
2003	122.8	140.8	188.9
2004	131.9	146.5	205.0
2005	131.9	152.2	221.4
2006	131.9	157.8	238.2
2007	132.0	163.4	255.3
2008	132.0	168.9	272.8
2009	132.1	174.3	290.7
Average	122.8	148.4	214.6
Mean	168.7		

How does the Forest Service Maintain an Orderly and Predictable Timber Sale Program?

Pools of Timber (Pipeline Volume)

As discussed earlier, the Forest Service tracks accomplishment of various stages of development of each timber sale with the Gate System process. From a timber sale program standpoint, it is also necessary to track and manage multiple projects through time as projects collectively move through the Gate System. Tracking of the multiple projects can be likened to following various segments of several projects through a pipeline of time. Because of the relatively long timeframes needed to accomplish a given timber sale and the complexities inherent in timber sale project and program development, it is necessary to track various timber sale program volumes from Gate 1 through Gate 6. Gate 1 volume represents a large pool of program volume, but represents a relatively low investment from project to project. This relative investment level offers the timber program manager a higher degree of flexibility and thus, does not greatly influence the flow of volume through the pipeline. In addition, tracking of how much volume near the end of the pipeline that is in appeals or litigation may be necessary to determine potential effects on the flow of potential timber sales.

The goal of the Tongass National Forest is to provide an even flow of timber sale offerings on a sustained yield basis. In past years, this has been difficult to accomplish due to continual reductions in the suitable timber land base, reductions in the timber industry processing capabilities, rapid market fluctuations and Forest Plan modifications and litigation. To achieve an even flow of timber sale offerings, 'pools' of projects in various stages of the Gate System will be maintained so volume offered can be balanced against current year demand and market cycle projections. Today, upward trends in demand are reacted to by moving outyear timber projects forward leaving outyears not capable of

meeting the needs of the industry. In other instances, a number of new projects are started based on today's market but not available for a number of years. By the time the added projects are ready for offer, the market and demand for this volume has changed. Three pools are being tracked to achieve an even flow of timber sale offerings:

1. **Timber volume under analysis (Gate 2)**: Timber volume under analysis, contains sales being analyzed and undergoing public comment through the NEPA process. This process can often take from one to five years and reaches a significant milestone when a NEPA decision is made. This pool includes any project with a formal Notice of Intent through those with a decision document issued. Volume in appeals and litigation will be tracked as a subset of this pool as necessary.

2. **Timber volume available for sale (Gate 3, Gate 4 and Gate 5)**: Timber volume available for sales, contains sales for which environmental analysis has been completed, and administrative appeals, and litigation (if any) have been resolved. They have also been fully prepared, and are available to managers to schedule for sale offerings. Managers need to maintain enough volume in this pool to be able to schedule future sale offerings in an orderly manner of the size and configuration that best meets the need of the public. As a matter of policy, and sound business practice, the Forest Service attempts to announce probable future sale offerings at least one year in advance. This allows potential purchasers an opportunity to do their own evaluations of these offerings in order to determine whether to bid, and if so, at what level.

3. **Timber volume under contract (Gate 6)**: Timber volume under contract contains sales which have been sold and a contract awarded to a purchaser, but have not yet been fully harvested. Timber contracts typically, but not always, give the purchaser three years to harvest and remove the timber purchased. Long standing Forest Service practice is to attempt to maintain about two to three years of unharvested timber volume under contract to timber purchasers. This volume of timber is the industry's dependable timber supply which allows immediate flexibility in business decision. This practice is not limited to the Alaska Region, but is particularly pertinent to Alaska because of the nature of the land base. The relative absence of roads, the island geography, the steep terrain, and the consequent isolation of much of the timber land means that timber purchasers need longer-than-average lead times to plan operations, stage equipment, set up camps, and construct roads prior to beginning harvest.

What drives the various timber sale program pipeline pool volume is a combination of actual harvest and projected demand. As purchasers harvest timber, they deplete the volume under contract. Managers track harvest, and offer sales that give the industry as-a-whole the opportunity to replace this volume and build or maintain their working inventory. Although there can be significant variation for practical reasons from year to year, in the long-run, over both the high points and low points of the market cycle, timber harvest will equal timber sales.

The amount of pipeline volume in each of the pools is determined by the Forest Service based on historical patterns. Table 2, the Pipeline Matrix, displays what volume levels are expected to be maintained in each pool. Pool 1-Timber Volume Under Analysis is expected to be maintained at approximately 4.5 times the amount of anticipated harvest; Pool 2-Timber Volume Available for Sale is expected to be maintained at approximately 1.3 times the amount of anticipated harvest, and Pool 3-Volume Under Contract is expected to be maintained at approximately 3 times the amount of anticipated harvest. The objective of the pools concept is to maintain sufficient volume in preparation and under contract to be able to respond to yearly fluctuations in a timely manner.

Table 2. Pipeline Pool Matrix

Pipeline Pool Volume	Flows	Start of Year One	During Year One	End of Year One
1. Volume Under Analysis (Gate 2)		238	401	230
	NEPA Decision	126	343	171
2. Volume Available for Sale (Gates 3, 4, and 5)		79	266	159
	Offered		163	
	Sold		148	
3. Volume Under Contract (Gate 6)		325		352
	Volume Harvested*		121	
*Note-The amount of volume estimated to be harvested for the year sets the basis for what will be maintained in Pools 1-3 (Gates 2 through 6). Should this estimate be incorrect, adjustments can be made in the following years without significant departures in outyear programs capabilities.				

Matrix crosswalk between Gate Tracking System and Pools of Timber Concept:

Gate 2: Proposed timber volume with a published decision document (Record of Decision) that is viable for sale after completion of appeals and litigation.

Gate 3: NEPA cleared timber volume with field preparation work completed and the timber sale ready to be offered in a timber sale contract package.

Gate 6: Timber volume under contract.

Timber volume in appeals and/or enjoined in litigation *	55	Million Board Feet

*As of 09/30/99. The volume in appeals and or enjoined in litigation is updated on a quarterly basis.

How Does the Forest Service Decide Where Timber Sale Projects Should be Located?

Allowable Sale Quantity

The Modified 1997 Forest Plan ROD established an ASQ for timber at 1.87 billion board feet per decade which equates to an annual average of 187 MMBF. The ASQ serves as an upper limit on the amount of timber that may be offered for sale as part of the regularly scheduled timber sale program. It consists of two separate NICs called NIC I, which is 1.53 billion board feet of timber per decade, and NIC II, which is .34 billion board feet per decade. The purposes of partitioning the ASQ into two components are to maintain the economic sustainability of the timber resource by preventing the over-harvest of the best operable ground, and to identify that portion of the timber supply that is at risk of attainment because of marginal economic conditions. The NIC I component includes lands that can be harvested with normal logging systems. The NIC II component includes land that has high logging costs due to isolation or special equipment requirements. Most of these NIC II lands are presently considered economically and technically marginal.

Immediately following the issuance of the Modified 1997 Forest Plan ROD by the Deputy Under Secretary of Agriculture, James Lyons, the Forest Service began an analysis of the ROD to develop consistent methodologies for its implementation (Implementation of Tongass Land Management Plan, 1920/1950, James A. Bartelme, Forest Supervisor, May 11, 1999). The purpose of the analysis was to develop methodology to ensure the modified Forest Plan changes received a consistent implementation approach across the Tongass, and to determine where the land base existed to begin programming current and future timber sale projects.

The Tongass National Forest has been unified under one Forest Supervisor overseeing the three combined Administrative Areas (Chatham, Stikine and Ketchikan). The ASQ is disaggregated by Ranger District offices for planning and scheduling purposes. Each District has been allocated a portion of the timber harvest program based on the FORPLAN computer run and availability of suitable and available acres, to implement the Forest Plan, and Section 101 of the Tongass Timber Reform Act (1990). The Forest Plan set the Forest ASQ upper limit at 187 MMBF per year. The distribution of the planned ASQ harvest among the Districts is listed in Table 3 (all volumes are identified as sawlog plus utility).

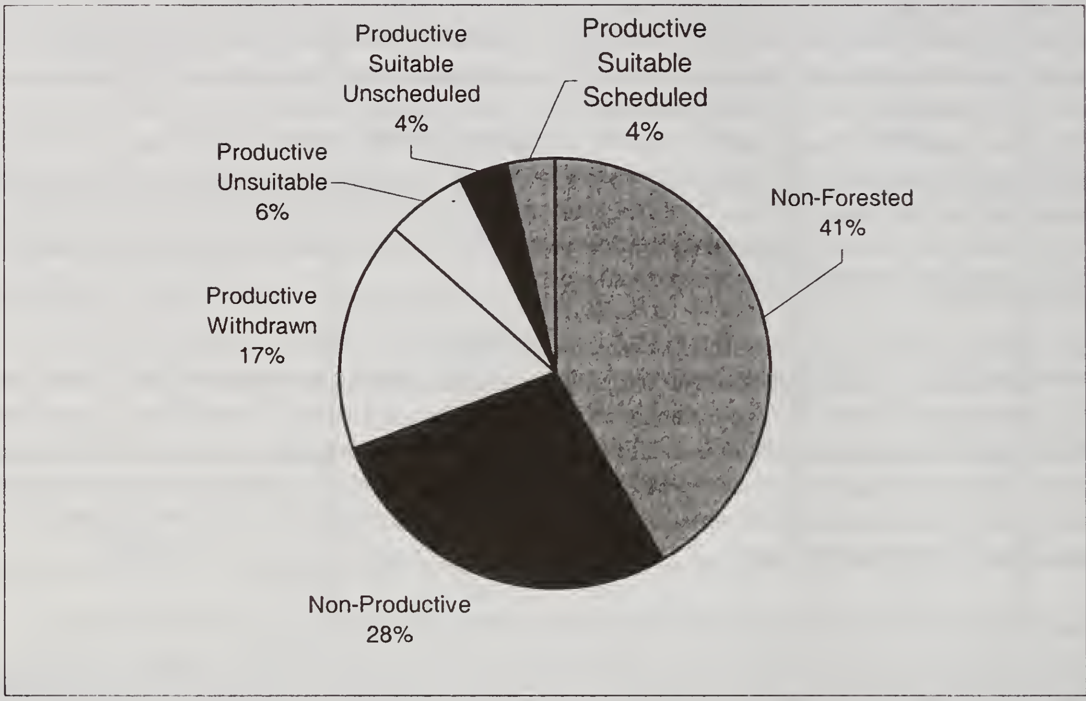
Table 3. Distribution of ASQ Among the Tongass National Forest Ranger Districts

Tongass NF Ranger District	Non-Interchangeable Components	
	NIC I	NIC II
Ketchikan	18	4
Thorne Bay	21	5
Craig	18	4
Wrangell	24	4
Petersburg	37	8
Sitka	12	3
Hoonah	6	2
Juneau	12	3
Yakutat	5	1
Admiralty	0	0
NIC Totals	153	34
ASQ Total	187	

Historically, timber harvest activities were generally concentrated in the central and southern portions of the Tongass. Now, under the Modified 1997 Forest Plan, the suitable timber land base is more evenly distributed across the Forest. As a result, it is necessary to lessen harvest on the southern end and begin planning projects in areas further north. In answer to the question presented for this section of the appendix, the suitable timber base is capable of producing the ASQ documented in the Modified 1997 Forest Plan ROD. However, harvest activities will be more evenly distributed than they were in the past.

Chart 1. 1997 Modified Forest Plan Land Allocations, depicts the productive suitable land base that is scheduled for timber harvest activities. Four percent of the Tongass land base generates the ASQ of 187 MMBF per year. The remainder of the land, approximately ninety-six percent, does not allow or will not support timber harvest activities.

Chart 1. 1997 Modified Forest Plan Land Allocations



District-Level Planning

The Forest Supervisor for the Tongass National Forest has discrete responsibilities for the overall management of the Forest's timber sale program. Included within these responsibilities is making the determination on the amount of timber volume to be made available to the industry as described above. Once a determination is made for the current year (annual demand) offer level, the information is presented to Congress via the Regional Forester and Chief of the Forest Service. Whether or not funding is appropriated to attain the program is the responsibility of the Congress and the President of the United States.

While the debate on funding takes place, the Tongass Forest Supervisor directs the District Rangers to formulate timber sale schedules that attain the prescribed offer level for the current year as well as develop outyear timber programs based on projected market demand for the planning cycle. It is the Ranger's role to recommend to the Forest Supervisor timber sale projects that meet forest plan goals and objectives. Districts work on various projects simultaneously resulting in continual movement of projects through the stages of the timber program pipeline. Their schedule allows the necessary time to complete preliminary analysis, resource inventories, environmental documentation, field layout preparations and permit acquisition, appraisal of timber resource values, advertisement of sale characteristics for potential bidders, bid opening, and physical award of the timber sale. Once all of the Rangers' recommendations are made and compiled into a consolidated schedule, the Forest Supervisor is responsible for the review and approval of the final plan.

Pending Congressional appropriations, the sale schedule is implemented. In the event insufficient funds are appropriated to achieve the desired outputs, timber sale projects are selected and implemented on a priority basis. Generally, the higher priority projects include sales where investments such as, road networks, camps or log transfer facilities have already been established. Those sales that are not implemented or only partially implemented are moved to the outyears. The sale schedule becomes very dynamic in nature due to the number of influences on each of the districts. A formal review of the schedule is done annually by the Forest Supervisor in consultation with the District Rangers, and amendments are made as needed through the course of the year. (The Tongass Timber Sale Plan is located on the Tongass National Forest Website)

NFMA requires the Forest Service to develop timber sale schedules that encompass the life of the forest plan. The recent Tongass National Forest planning process culminated upon issuance of the Modified 1997 Forest Plan ROD for the Tongass Land and Resource Management Plan. In response to this Plan, the Tongass has prepared a Ten Year Timber Sale Schedule for Fiscal Years 2000-2009. Fiscal Year 2000 offer level is based on annual market demand estimates. The remaining years, 2001-2009 are based on market demand projections over the planning cycle. Table 4, Tongass Ten Year Timber Sale Schedule-Fiscal Year 2000, denotes the first year of the ten-year plan. Fiscal Year 2000 is listed below to show the reader an example of the information available and display the timber sales scheduled for the current fiscal year.

Table 4. Tongass Ten Year Timber Sale Schedule-Fiscal Year 2000

NEPA Project	Decision Date	RD	S+U (MMBF)	Sale Name	Vol S+U (MMBF)	Class	FY00 Gate 2	FY00 Gate 3	FY00 Gate 5
Sea Level EIS	May-99	KRD		Madder	26	S			26
Sea Level EIS	x	KRD		Buckdance	11	S			11
Sea Level EIS	x	KRD		Orion	13	S			13
Craig Small Sales EA	x	CRD	1.5	Craig Small Sales	1.5	S	1.5	1.5	1.5
TNB Small Sales EA	x	TNB	5	Various	5	S	5	5	5
Luck Lake EIS	Jan-00	TNB	13	Luck Lake	5	S	13	5	5
Luck Lake EIS	x	TNB		Twin Bridge	8	S		8	8
Couverdan CE	Jun-00	JRD	0.8	Couverden Salvage	0.8	S	0.8	0.8	0.8
8-FATHOM EIS	Apr-96	HRD		Midway	6.4	S		6.4	6.4
HRD Small Sales EA	x	HRD	0.2	Small sales	0.2	S	0.2	0.2	0.2
NW BARANOF EIS	Feb-96	SRD		Schultz	8	S		1	8
Small Salvage Sale CE	x	YRD	0.2	Small Salvage Sale-00	0.2	S	0.2	0.2	0.2
Woodpecker EIS	(May-00)	PRD	(5-18)	Woodwork	1	S	18	1	1
Twin Creek EA	Aug-98	PRD		Twin Creek heli (41,66)	1.5	S		1.5	1.5
Twin Creek EA	Aug-98	PRD		Twin Creek 15	0.1	S		0.1	0.1
South Lindenberg EIS	Dec-96	PRD		South Central (U140)	1.5	S		1.5	1.5
South Lindenberg EIS	Dec-96	PRD		S.Lindy SE	10	S		10	10
East Fork EA	Jul-88	PRD		East Fork	2	S		2	2
Bohemia Mountain EIS	Jun-95	PRD		Goose (Unit 538)	1	S		1	1
Doughnut EA	x	WRD	8	Doughnut	4	O	8	4	4
Skipping Cow EIS (X)	x	WRD	20	Skipping Cow	20	S	20	20	20
Kuakan EIS	x	WRD	12	Kuakan	12	S	12	12	12
Total			**40**		**138.2**		**40**	**81.2**	**138.2**

NOTE: The difference between projected volume (148 MMBF) and offer volume (138 MMBF) will be made up from re-offer/reconfigured unsold FY 98/99 timber sales.

The Ten Year Schedule provides a significant amount of information and is described as follows:

Title	Description
NEPA Project	Environmental document project name. This name may or may not differ from the timber sale project name depending on how many sales originate from the original NEPA document.
Decision Date	The date of the decision document whether planned or actual. 'x' denotes project has started and completion is within the FY noted under column H.
RD	Ranger district office project is located (PRD=Petersburg Ranger District).
S+U (MMBF)	Anticipated timber volume (sawlog plus utility) expected from the NEPA document. Generally only appears once in the year the decision is made. If no volume shown, decision on document was made in another fiscal year.
Sale Name	Timber sale project name.
Vol S+U (MMBF)	Timber sale project volume (sawlog plus utility).
Class	Timber sale size class determination (S-SBA, O=open sale to all bidders).
FY00 Gate 2 (NEPA)	Only appears in the year the NEPA document will be decided. Number designates potential volume.
FY00 Gate 3 (Layout)	Only appears in fiscal year sale is to be laid out and appraised. May appear in more than one year.
FY00 Gate 5 (Offer)	Only appears in fiscal year sale is to be offered. Number designates potential volume.

The location of timber sale projects are based on the land allocation directed in the Forest Plan decision. Timber sales are located where permitted based on the prescription and objectives of the land use designation. Timber sale projects are located to varying degrees in land use designations identified as timber production, modified landscape, and scenic viewshed.

As stated earlier, the District Ranger is responsible for identifying and recommending the project areas for the Ten Year Timber Sale Schedule. The considerations the Ranger makes on each project includes but are not limited to the following:

1. The project area contains a sufficient number of acres allocated to development land use designations to make timber harvest in the area appropriate under the Forest Plan. There is an adequate amount of suitable and available land for timber harvest opportunities. Available information indicates harvest of the amount of timber volume being considered for this project can occur consistent with the Forest Plan standards and guidelines and other resource protection requirements.

2. The project and proposed timber harvest volume can contribute to achieving the goals and objectives of implementing the Forest Plan.

3. The potential investment in infrastructure (roads, bridges, log transfer facilities, camps, rock pits, etc.) is necessary for sustainable timber harvest offerings. Where infrastructure already exists, this project will enable maintenance and upgrade of the facilities, which is necessary for removal of timber volume.
4. The potential effects on subsistence and other resources.

5. Based on current year and anticipated outyear timber volume demand; volume currently under contract; anticipated Congressional allocations; and the availability of resources to

fully prepare and offer this project for sale, this project is consistent and meets Forest Service Policy in the Alaska Region, Regional Guide; Best Management Practices; the Modified 1997 Tongass Land and Resource Management Plan; and all other laws and regulations governing the removal of timber from National Forest System Lands.

How Does this Project Fit into the Tongass Timber Program?

The Skipping Cow Timber Sale is scheduled for offer in Fiscal Year 2000 (Tongass National Forest Ten Year Timber Sale Schedule, approved by Thomas Puchlerz, Forest Supervisor, dated 10/20/99). Forest-wide, total offer volume being planned for Fiscal Year 2000 is 148 MMBF. In order to achieve the planned offer date, the Skipping Cow Timber Sale has a scheduled Gate 2 completion date of Fiscal Year 2000 with Gate 3 implementation to begin by Fiscal Year 2000.

The Skipping Cow Timber Sale is currently in Gate 2 "Volume Under Analysis." The project's action alternatives being addressed in the NEPA analysis range from 19.1 MMBF to 24.4 MMBF that could contribute to the Tongass Timber Sale Program. As described earlier, the volume of timber needed to maintain the NEPA decision pool during year one is 343 MMBF. Currently, forest-wide the NEPA decision pool contains 161.9 MMBF exclusive of this project. Potential selection of an action alternative for this project would bring the volume in the NEPA decision pool between 181.0 and 186.3 MMBF. Therefore, the Skipping Cow Timber Sale(s) Project is consistent with the program planning objectives and necessary to meet the goal of providing an orderly flow of timber from the Tongass on a sustained yield basis. Given the included information, it is reasonable to be conducting the environmental analysis for this project at this time.

Why Can't this Project Occur Somewhere Else?

As previously discussed, the market demand for timber for the next ten years is expected to average 160 MMBF per year. The suitable and available land base on the Tongass is capable of supporting an ASQ of 187 MMBF annually, 153 MMBF of which is considered economical (i.e. the NIC I component). Based on the projected market demand for the planning cycle, all suitable timberlands will eventually be scheduled for harvest to meet the current and projected demand for raw material in Southeast Alaska. The cumulative impact on other resources from past harvest activities, the location of timber sales under contract, and the eventual use of all suitable lands for timber sale projects makes the relocation of this project in another area inefficient and potentially contrary to the standards and guidelines of the Forest Plan.

- Areas with available timber will be necessary to consider for harvest in order to seek to provide a supply of timber from the Tongass National Forest which (1) meets the annual market demand for timber from such forest and (2) meets the market demand from such forest for each planning cycle, pursuant to Section 101 of the Tongass Timber Reform Act (TTRA).

- The potential effects on subsistence resources are projected to differ little based on the sequence these areas are harvested. Harvesting other areas with available timber on the Tongass National Forest is expected to have similar potential effects on resources, including those used for subsistence, because of widespread distribution of subsistence use and other factors. Harvest within other areas is foreseeable, in any case over the forest planning horizon under the Forest Plan.

- Providing substantially less timber volume than required to meet Forest Plan and TTRA Section 101 timber supply and employment objectives in order to avoid harvest in the project area is not necessary or reasonable.

- It is reasonable to schedule harvest in the project area rather than in other areas at the present time based on previous harvest entry and access, level of controversy over subsistence and other effects, the ability to the complete NEPA process and make timber available to meet the needs of dependent industries. Other areas that are reasonable to consider for harvest in the near future are the subject of other project EISs that are currently ongoing or scheduled to begin soon.

Attachment 1

United States Department of Agriculture | Forest Service | Alaska Region Tongass National Forest | 648 Mission Street Ketchikan, Alaska 99901 907-225-3101 FAX 907-228-6215

File Code: 1920 **Date:** May 11, 1999
Route To: 1950

Subject: Implementation of Tongass Land Management Plan

To: Tongass Assistant Forest Supervisors and District Rangers

On April 13, 1999 the Deputy Under Secretary of Agriculture, James Lyons, signed a new Record of Decision (ROD) for the Tongass Land Management Plan. This ROD contained modifications to the 1997 Forest Plan. The purpose of modifying the 1997 Forest Plan decision was to put an end to the appeals and move forward with consistency and stability in our management of the Tongass National Forest resources. By my direction, over the past two weeks Dave Arrasmith, Forrest Cole, and Gene Degayner have been developing methodology to ensure these changes received a consistent implementation approach across the Tongass. Based on their work, the following is my initial direction for implementing their recommendations. Further direction for implementation may follow at a later date after a thorough review of the planning record from the Washington Office and annual monitoring and evaluation.

LUD Changes - The 1999 TLMP Record Of Decision (ROD) changed the Land Use Designation from development to mostly natural for 18 areas, totaling approximately 500,000 acres. These become additional acres assigned to particular specified Land Use designations in the Forest Plan. These acres will be managed in accordance with the standards and guidelines, and other management direction and provisions specified in the Plan. These adjustments are described in detail in the ROD and are displayed in Appendix B. The enclosed 1999 Forest Plan map depicts these changes precisely as specified within the ROD. To implement these changes in LUD's the following projects will be modified as specified:

- Lab Bay EIS - There are two units in the newly created natural setting LUD's currently being advertised as part of the 163 MMBF re-offered timber sales.

- Shamrock EIS - A portion of the Shamrock EIS (Clover timber sale) was offered and unsold during FY98. The Forest Service has re-offered this sale as originally advertised in FY98. If the re-offered Clover timber sale is purchased, the sale will be implemented as directed. If the sale is unsold prior to October 1, 1999 then the portion of the project modified by LUD changes from development prescriptions to non-development prescriptions will be deleted. The remaining portions of the Clover project as well as the remaining portions of the Shamrock EIS may proceed.

- Port Houghton - Delete the units in non-development LUD's from the selected alternative. The remainder of the project may proceed. The District Ranger should give careful consideration to alternatives which do not require construction of roads through non-development LUD's to access the timber.

- Douglass - The portion of the project in non-development LUD's is deleted. The District needs to evaluate the remaining portion of the project's viability following the bid openings of the FY98 Re-offer of the Clover timber sale.

- Three Mile - VCU 419 remains in the suitable timber base. The District Ranger needs to conduct an analysis on this portion of the project area to determine if there is a viable timber sale remaining.

- Port Stewart EIS - Drop entire project.

- Keete EIS - Drop entire project.

- Finger Mountain EIS - The District Ranger is directed to analyze this project to determine if a viable sale offering still exists.

- Dry Straight EA - The District Ranger is directed to analyze this project to determine if a viable sale offering still exists.

- Vixen EIS - Drop the entire project.

All other projects on the current five year sale schedule may proceed as planned. Specific questions have arisen regarding the Emerald Bay timber sale. While this project is on Cleveland Peninsula, it is not within the 18 areas specified within the Appendix B of the 1999 ROD. The District Ranger is directed to continue the project through the planning process recognizing and incorporating the new ROD.

200 Year Rotation - The record of decision includes a new Standard & Guideline which states;

"C. To emphasize deer habitat capability in project level planning decisions, select timber harvest rotations of 200 years or greater within the "development" Land Use Designations (LUD's) within the following 42 Wildlife Analysis Areas (WAA's): 101, 510, 1003, 1211, 1214, 1315, 1317, 1318, 1319, 1332, 1420, 1421, 1422, 1525, 1527, 1529, 1530, 1531, 1605, 1904, 1905, 1906, 2007, 2306, 3001, 3002, 3003, 3308, 3312, 3313, 3314, 3524, 3525, 3526, 3627, 4252, 5012, 5018, 5132, 5135, 5136, and 5138."

To implement this standard and guideline the suitable timber base will be divided into two additional non-interchangeable components, one for 200 year rotations and one for 100 year rotations. The 100 year rotations will emphasize more rapid timber harvest, while the 200 year rotations will conserve old growth for a longer period of time while still meeting the objectives of the Land Use Designations where they are located.

In the 200 year rotations, no second growth will receive even-aged harvest prescriptions until it reaches a minimum age of 200 years. The remaining old growth suitable for timber harvest will have it's harvest metered out, as evenly as possible, over time until the second growth becomes available for intermediate treatments. Since approximately 84% of the Tongass' second growth now resides in 200 year rotation WAA's, a decadal even flow of old growth acres is not possible. The result is a decadal ceiling which will be placed on the amount of acres which can be harvested from these lands forest-wide. I have calculated this ceiling to be approximately 28,000 acres for the first decade of implementation. A question will be added to the TLMP Monitoring

Plan to annually measure how close we are to this decadal ceiling. The ten year timber sale schedule will be adjusted to implement this direction.

The current ongoing projects for the first five years of the ten year sale schedule, would affect a total of 12,862 acres within the 200 year rotations. This is well under the decadal ceiling of 28,000 acres imposed by the new ROD. Therefore, projects currently in the NEPA process within the 200 year rotations will continue through the planning process. We will review the last five years of the ten year timber sale schedule and revise it as necessary to stay under the 28,000 acre decadal limit. Continuing with these ongoing timber sale planning efforts will provide economic benefits and stability to the small timber sale operators (primarily located on Prince of Wales Island) along existing road systems. It will also protect the substantial financial investment the government has already made in these projects through force account as well as service contracts. The following factors were the primary ones I considered in selecting this methodology for implementing the 200 year rotation standard and guideline.

- Deer Habitat - Implementing the standard and guideline as specified above will allow project level decisions to protect site specific deer habitat. Protection is expected to be achieved through better identification of deer habitat, deferring timber harvest activities for longer periods of time, and utilizing silvicultural prescriptions consistent with deer habitat objectives. The longer rotation and metering out of old growth in association with a forest wide ceiling will allow project decisions to protect key deer winter range (high volume, low elevation, south facing slopes), maintain corridors for connectivity, and address site specific issues. Implementation of the standard and guideline in this fashion also maintains more acres of old growth in the 200 year rotations for longer periods of time. Approximately 130,000 more acres of old growth will exist in the 200 year rotations at the year 2060 than would exist under a 100 year rotation methodology.

- Small Timber Operators - A key objective of mine for the Tongass timber sale program is to provide a sustainable volume of timber for our existing small operators. These operators typically operate off existing road systems. This method of implementing the 200 year rotation will provide the volume necessary to achieve this objective as well as contribute to the small scale value added timber industry. This method also maintains our most efficient salvage operations and means of maintaining road systems with limited resources.

- 10 Year Sale Program - The 1999 ROD establishes an ASQ of 187 MMBF (NIC I and II). The method for implementing the new standard and guideline as specified above will give the Tongass an opportunity to provide a ten year sale program which approximates an amount at or near the estimated NIC I (153 MMBF) level. Therefore if adequate funding is provided, it is possible for us to accomplish the NIC 1 level of the 187 ASQ with a modified sale program.

- Roadless Areas - This method of implementing the standard and guideline provides some additional flexibility in the rate of entry into old growth on existing roadless areas. By allowing some harvest in roaded areas with existing infrastructure, roadless areas can be entered at a slower rate. Therefore the Forest will have more flexibility in timing of entry into roadless areas to address specific public issues associated with these areas.

The results of this method for implementing the 200 year rotation fully meets the intent specified in the 1999 ROD for protecting deer habitat as well as providing harvest levels that meet the revised ASQ as specified in the ROD.

Road Density - The 1999 Record of Decision modified the Forest-wide Standard and Guide within the Alexander Archipelago Wolf section to now state:

"Open road densities of 0.7 miles or less per square mile are necessary to reduce mortality to sustainable levels."

The language in the ROD did not specify over what scale to apply this S&G. However, the issue of scale for the Alexander Archipelago Wolf S&G was already clarified by the interagency Tongass Plan Implementation Team and the Forest Supervisor. That clarification is still valid. That clarification states in part *"Wolves tend to have home ranges that cross several Wildlife Analysis Areas (WAA's). Therefore the appropriate scale over which to use the model should be combinations of WAA's or the biogeographic province. Using the model at the watershed or VCU scale is too fine a resolution for using the model. Conversely, the Forest or Area is too large or coarse of a scale to provide meaningful analysis."* Therefore, the appropriate scale at which to apply this standard and guideline is combinations of WAA's or the biogeographic province.

The wording in the modified Standard and Guideline was also changed from *"may be necessary"* to *"are necessary"* . However, this change must be viewed within the overall context of the entire section. The Standard and Guideline contains a series of sequential steps to be taken prior to applying this specific section.

Step 1 is specified in the beginning of the Standard and Guide where it states: *"Where wolf mortality concerns have been identified, develop and implement a Wolf Habitat Management Program."* This Program is to look at harvest levels as well as road access management. The Standard and Guide states further *" To assist in managing wolf mortality rates to within sustainable levels, integrate the Wolf Habitat Management Program (including road access management) with season and harvest limit proposals submitted to Federal and State Boards."*

Step 2 is to determine the cause of wolf mortality. The Standard and Guide further goes on to state; *"Where road access has been determined, through the analysis, to significantly contribute to wolf mortality, implement effective road closures to reduce mortality."*

Therefore while the Standard and Guideline as modified is now a "standard", it applies after all the proceeding steps have been completed.

NIC I and NIC II Recalculation - The 1999 Record of decision retains the roughly 80% to 20% split between the current NIC I and NIC II components as estimated in the 1997 Plan. However, the ROD also recognizes that these are merely estimates and need to be updated as part of project level planning. The District Rangers need to continue to update this NIC I to NIC II recalculation as part of the normal ongoing timber sale planning process. Individual projects will then be summarized in the annual TLMP monitoring report and any changes to the Forest Plan needed will be analyzed in that document.

Summary - Critics of the modified Plan decision have brought forth a challenge of the process. We need to remember that decisions of this magnitude usually receive review from our Washington Office legal advisors. And, as Chief Dombeck has pointed out, the Bureau of Land

Management as well as other agencies use similar processes. We need to move beyond this dialogue and focus our energies on how to best use our resources to implement the modified Plan.

Many thanks to everyone who has worked so hard to bring us to this point. I am excited that we have a final decision and can now get down to full focus on implementing the Forest Plan.

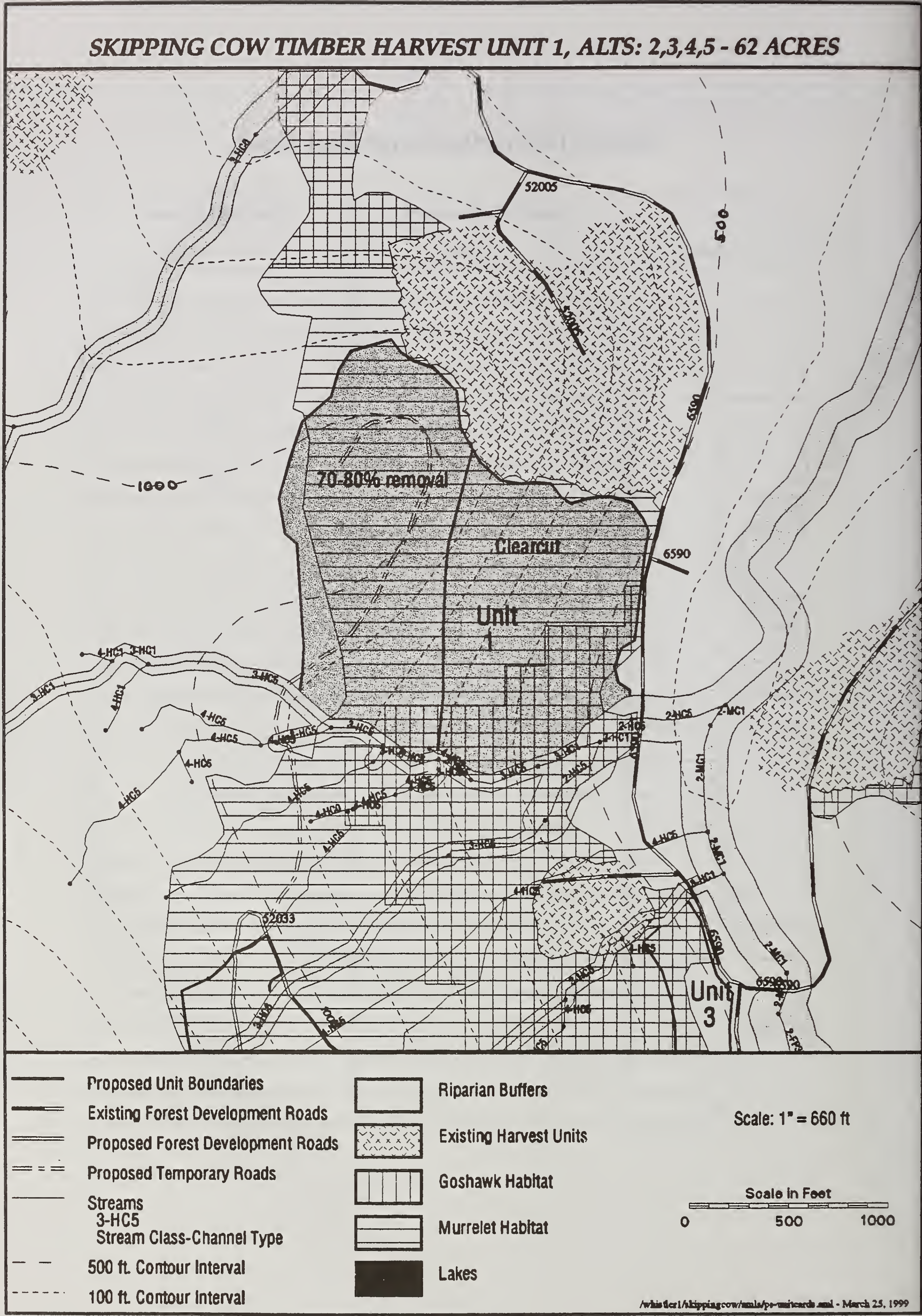
/s/ James W. Bartelme
JAMES W. BARTELME
Acting Forest Supervisor

Appendix B

Unit Cards

Timing Restrictions and Unit Cards

Unit	Marbled Murrelet May 1 to June 15	Sandhill Crane April 1 to June 15
1		
2		
3		
4		
5		X
6		
7		X
8		
9		
10		
11		
12	X	
13	X	
14	X	
15	X	
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		


SKIPPING COW TIMBER HARVEST UNIT 1, ALTS: 2,3,4,5 - 62 ACRES
70-80% removal
Clearcut
Unit 1
Unit 3
52005
52033
6590
500
1000
Proposed Unit Boundaries
Existing Forest Development Roads
Proposed Forest Development Roads
Proposed Temporary Roads
Streams
3-HC5
Stream Class-Channel Type
500 ft. Contour Interval
100 ft. Contour Interval
Riparian Buffers
Existing Harvest Units
Goshawk Habitat
Murrelet Habitat
Lakes
Scale: 1" = 660 ft
Scale in Feet
0
500
1000
March 25, 1999

SKIPPING COW TIMBER SALE - UNIT CARD Unit 1 In Alternatives 2, 3, 4, 5

Harvest Method: Alt. 2, 3, 5: Cable (running skyline), Alt. 4: helicopter
New road construction: Alt. 2, 3, 5
Unit Size: 62 acres

Harvest Volume: Alt. 2: 1,408 MBF
Alt. 3, 5: 1,584 MBF
Alt. 4: 1,496 MBF

UNIT DEVELOPMENT

Stand Type:
Gap-phase blowdown area. Trees over 150 years old with pockets of younger aged trees.

Stand Management Objectives:
Alt. 2: Future stand will be a two-aged stand (it will have two or more canopy layers). Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.
Alt 3,5: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.
Alt. 4: Portions of the stand within 1,000 ft. of Road 6594 will be even-aged (32 acres). The remaining 30 acres of the unit will be two-aged, 20 to 30 percent of the trees over 9 inches DBH will be retained.

Silvicultural Prescription:
Alt. 2 and the western 30 acres of Alt. 4: Remove 70 to 80 percent of the trees over 9 inches DBH. Trees less than 9 inches DBH and 20 to 30 percent of the trees over 9 inches DBH will be retained through the unit in clumps, small groups, and single trees. Their location will be determined by logging system capability. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.
Alt. 3,5 and the eastern 32 acres of Alt. 4: Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Release, possible planting, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries
Concern: Stream south of unit is Class III (HC5) flowing into Class II (HC5) Mustang Creek (tributary to North Meter Bight Creek).

Mitigation: Unit excludes sideslope adjacent to Class III stream and provides at least 100-foot no harvest buffer adjacent to Class II reach southeast of unit (BMPs 12.6, 12.6a). F1, F4

Soils/Wetlands
Concern: 2 acres of non-productive soils in the northwest corner of the unit.

Mitigation: Drop the non-productive acres from the unit. O2

Wildlife/TES Plants
Concern: There are approximately 12 acres of high probability goshawk nesting habitat (see map). There is a potential wildlife corridor along the stream which forms the southern border of the unit.

Mitigation: Implement Forest-wide standards and guidelines if a goshawk nest is found. Retain occasional large merchantable trees along the stream which forms the southern border of the unit. W1, W4, W9, W11

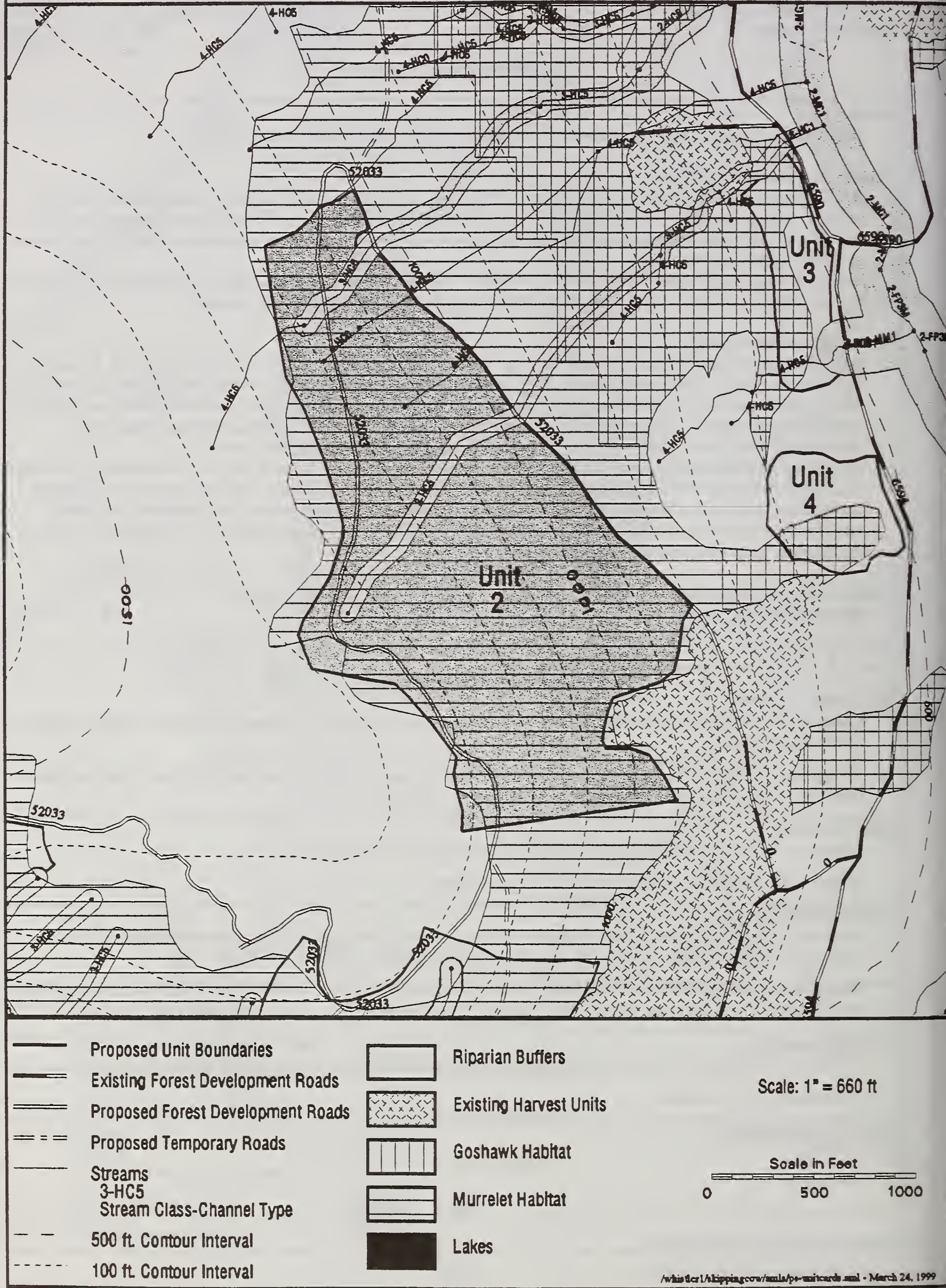
Visual/Recreation
Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway route.

Mitigation: None needed.

Other Resources/Issues
Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 2, ALTS: 2,3,4,5 - 75 ACRES



SKIPPING COW TIMBER SALE - UNIT CARD Unit 2 In Alternatives 2, 3, 4, 5

Harvest Method: Alt. 2, 3, 5: Cable (running skyline), Alt. 4: helicopter
New road construction: Alt. 2, 3, 5
Unit Size: 75 acres

Harvest Volume: Alt. 2,4: 1,557 MBF
Alt. 3, 5: 1,752 MBF

UNIT DEVELOPMENT

Stand Type:
Gap-phase blowdown area. Trees over 150 years old with pockets of younger aged trees.

Stand Management Objectives:
Alt. 2,4: Future stand to have two or more canopy layers. Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.
Alt. 3,5: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Alt. 2,4: Remove 70 to 80 percent of the trees over 9 inches DBH. Trees less than 9 inches DBH and 20 to 30 percent of the trees over 9 inches DBH will be retained through the unit in clumps, small groups, and single trees. Their location will be determined by logging system capability. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.
Alt. 3,5: Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Release, possible planting, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries
Concern: Unit contains one Class III (HC6) and nine Class IV (HC5 or HC0) stream reaches flowing into Class II headwaters of Mustang Creek (tributary to North Meter Bight Creek).

Mitigation: Unit requires field review to exclude sideslopes adjacent to Class III stream. Unit provides for full suspension of most Class IV streams by placing setting boundaries along stream courses. Provide full suspension whenever possible across Class IV streams; at least partial suspension is required (BMPs 12.6, 12.6a, 13.9, 13.16). F1, F4, F14

Soils/Wetlands
Concern:

Mitigation:

Wildlife/TES Plants
Concern:

Mitigation: W1, W4, W9

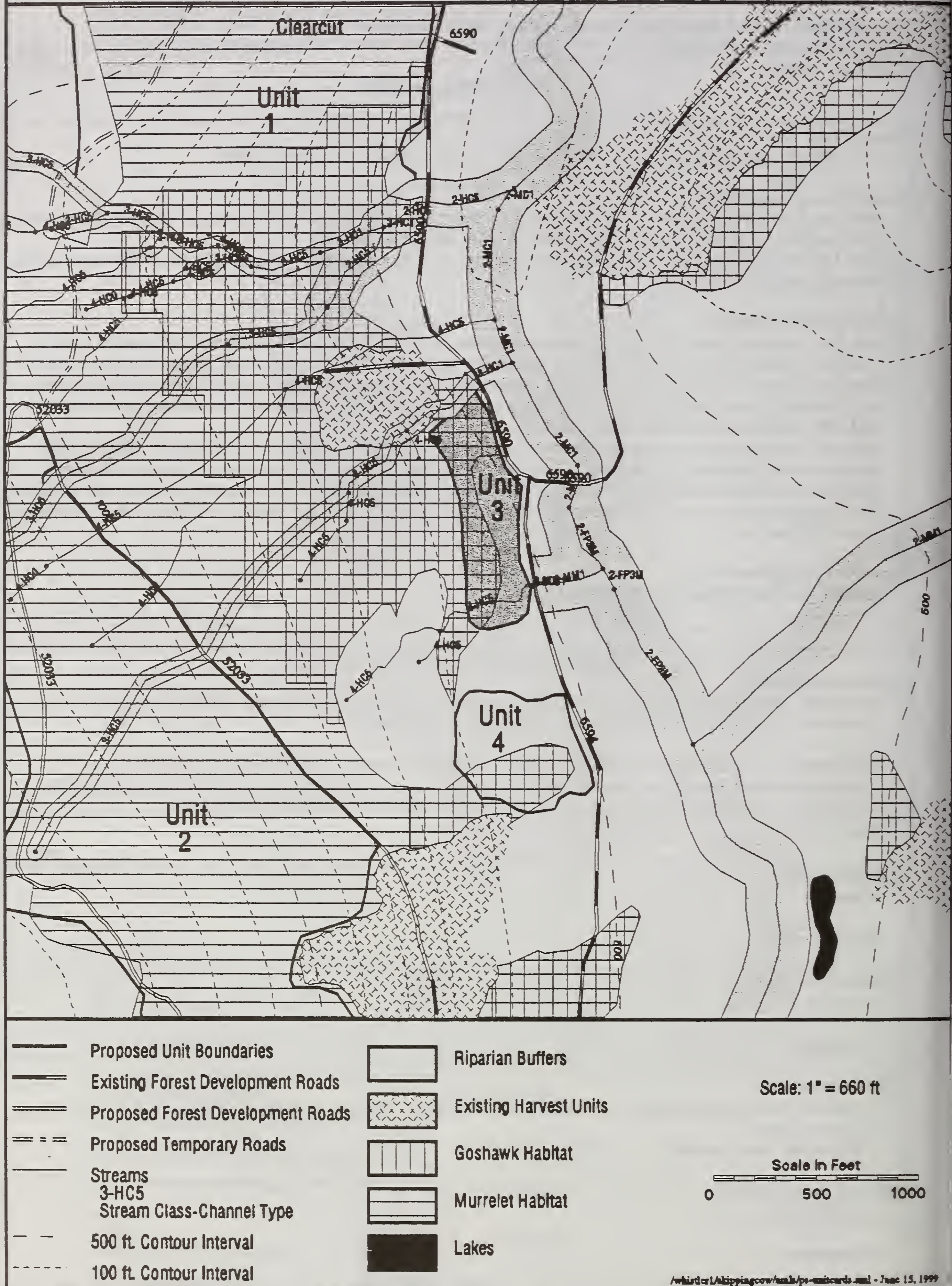
Visual/Recreation
Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway route.

Mitigation: None needed.

Other Resources/Issues
Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 3, ALTS: 2,3,4,5 - 7 ACRES



Harvest Method: Alt. 2,: running skyline, Alt. 3, 4, 5: highlead (downhill)
No new road construction
Unit Size: 7 acres

Harvest Volume: Alt. 2: 80 MBF
Alt. 3, 4, 5: 90 MBF

UNIT DEVELOPMENT

Stand Type:
Gap-phase area. Trees over 150 years old with pockets of younger aged trees.

Stand Management Objectives:

Alt. 2: Future stand to have two or more canopy layers. Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.

Alt. 3,4,5: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:

Alt. 2: Remove 70 to 80 percent of the trees over 9 inches DBH. Trees less than 9 inches DBH and 20 to 30 percent of the trees over 9 inches DBH will be retained through the unit in clumps, small groups, and single trees. Their location will be determined by logging system capability. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.

Alt. 3,4,5: Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:

Release, possible planting, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Class IV (HC5, HC1) streams within unit and north of unit flow directly into Class II (MM1, HC2) tributaries of Mustang Creek (tributary to North Meter Bight Creek).

Mitigation: Unit excludes Class II reaches which are limited to downstream side of Roads 6590 and 6594 (BMPs 12.6, 12.6a). Unit excludes north Class IV stream and provides for full suspension of at least one Class IV stream by placing setting boundaries along stream courses. Provide full suspension wherever possible across Class IV streams; at least partial suspension is required (BMPs 13.9, 13.16). F1

Soils/Wetlands

Concern:

Mitigation:

Wildlife/TES Plants

Concern: There are approximately 4 acres of high probability goshawk nesting habitat (see map).

Mitigation: Implement Forest-wide standards and guidelines if a goshawk nest is found. W1, W4, W11

Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway route.

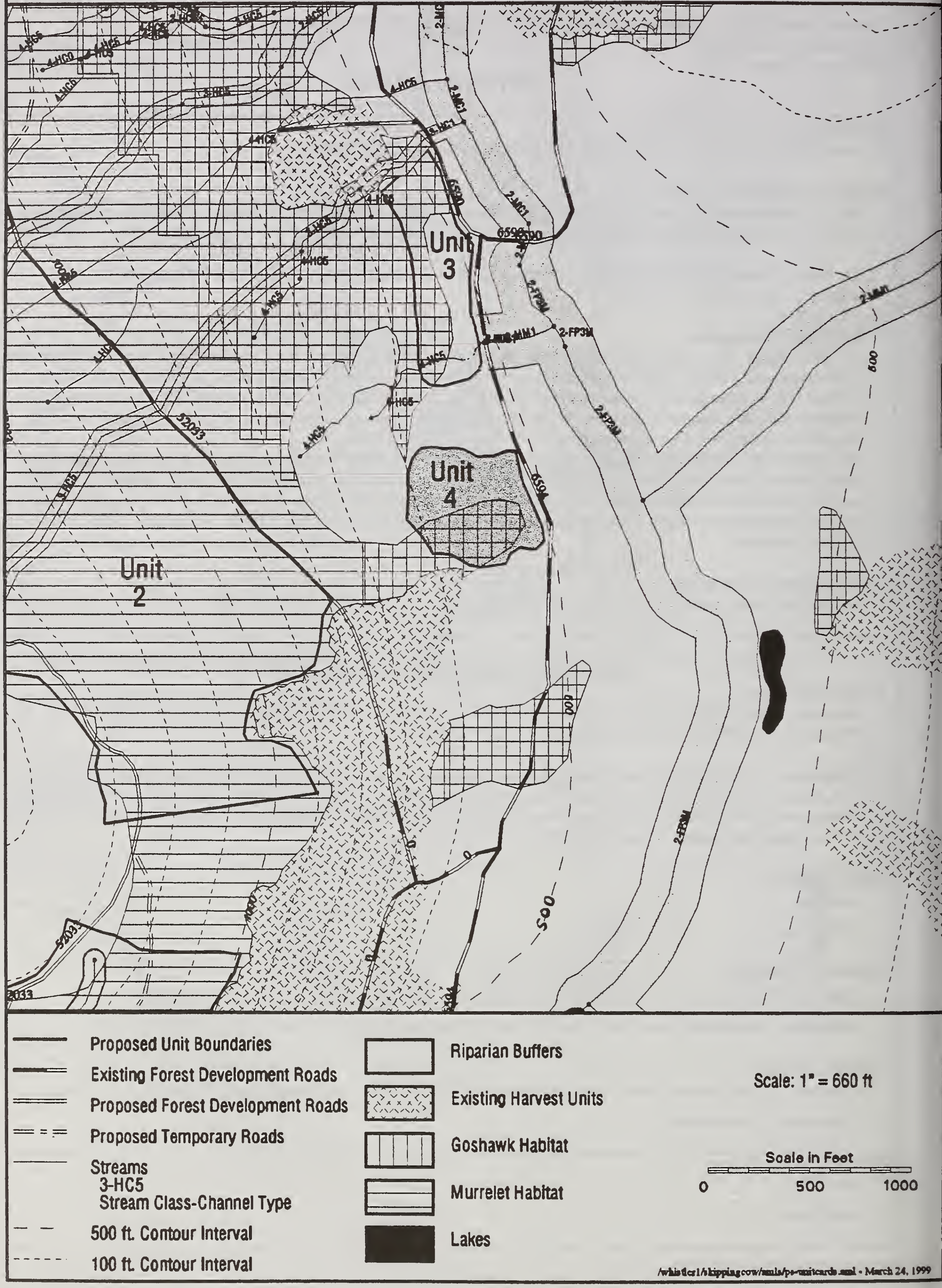
Mitigation: None needed.

Other Resources/Issues

Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 4, ALTS: 2,3,4,5 - 7 ACRES



SKIPPING COW TIMBER SALE - UNIT CARD Unit 4 In Alternatives 2, 3, 4, 5

Harvest Method: cable (Alt. 2: running skyline, Alt. 3, 4, 5: highlead (downhill)
No new road construction
Unit Size: 7 acres

Harvest Volume: Alt. 2: 60 MBF
Alt. 3, 4, 5: 68 MBF

UNIT DEVELOPMENT

Stand Type:
Gap-phase blowdown area. Trees over 150 years old with pockets of younger aged trees.

Stand Management Objectives:
Alt. 2: Future stand to have two or more canopy layers. Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.
Alt. 3,4,5: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Alt. 2: Remove 70 to 80 percent of the trees over 9 inches DBH. Trees less than 9 inches DBH and 20 to 30 percent of the trees over 9 inches DBH will be retained through the unit in clumps, small groups, and single trees. Their location will be determined by logging system capability. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.
Alt. 3,4,5: Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments: Release, possible planting, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries
Concern: Unit contains Class IV (HC5) streams tributary to Mustang Creek (tributary to North Meter Bight Creek).

Mitigation: Provide full suspension wherever possible across Class IV streams; at least partial suspension is required (BMPs 13.9, 13.16). F4

Soils/Wetlands
Concern:

Mitigation:

Wildlife/TES Plants
Concern: There are approximately 3 acres of high probability goshawk nesting habitat (see map).

Mitigation: Implement Forest-wide standards and guidelines if a goshawk nest is found. W1, W4, W11

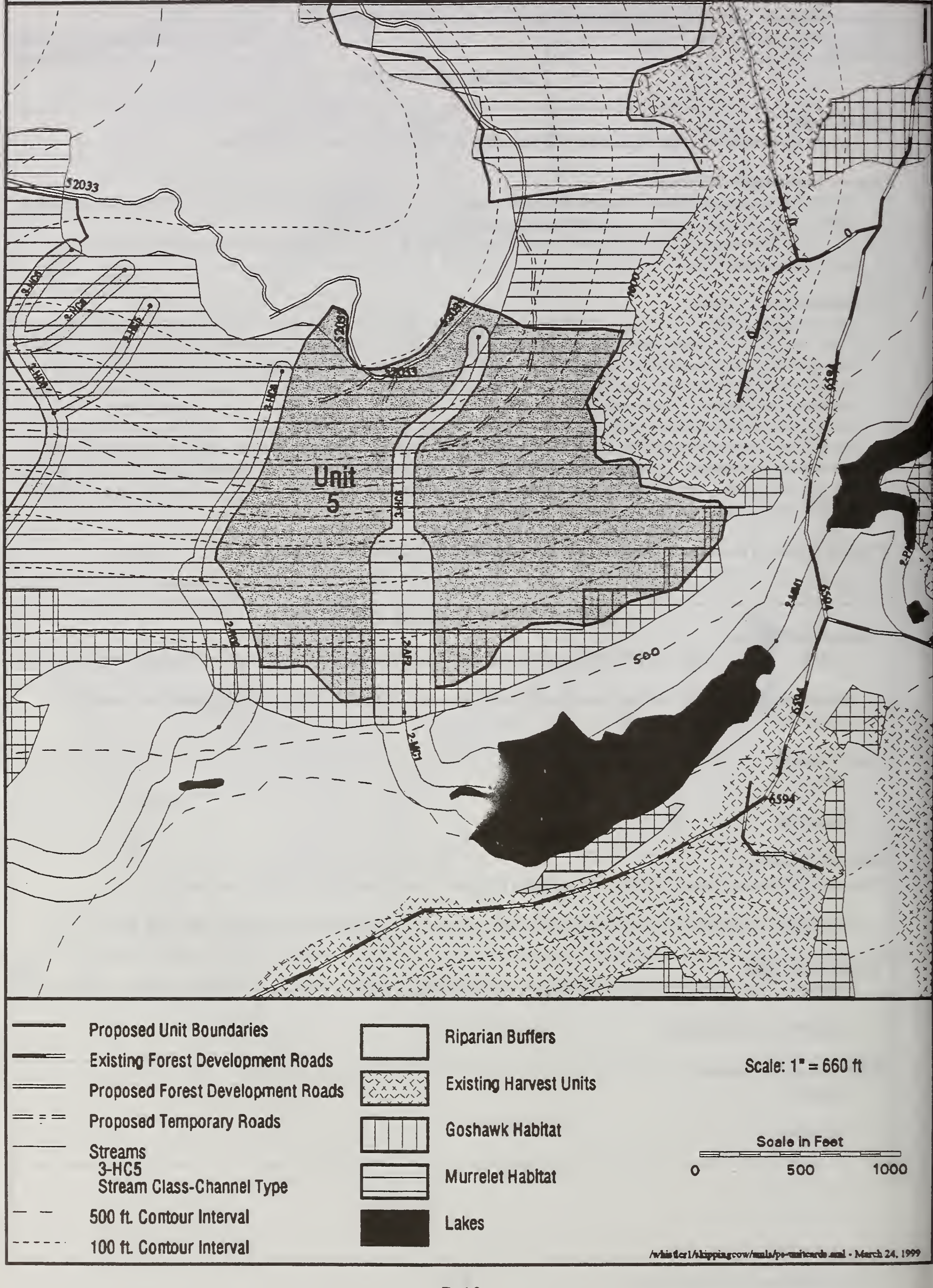
Visual/Recreation
Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway route.

Mitigation: None needed.

Other Resources/Issues
Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 5, ALTS: 2,3,4,5 - 63 ACRES



SKIPPING COW TIMBER SALE - UNIT CARD   Unit 5   In Alternatives 2, 3,4,5

Harvest Method: Alt. 2: slackline cable, Alt. 3, 5: live skyline cable, Alt. 4: helicopter
New road construction: Alt. 2, 3, 5
Unit Size: 63 acres

Harvest Volume: Alt. 2: 1,312 MBF
Alt. 3: 1,476 MBF
Alt. 4: 410 MBF
Alt. 5: 853 MBF

UNIT DEVELOPMENT

Stand Type:

Upper portion: wind-prone area. Trees over 150 years old. **Lower portion:** gap phase blowdown area.

Stand Management Objectives:

Alt. 2: Future stand to have two or more canopy layers. Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.

Alt. 3 and upper two-thirs of 5: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Alt. 4 and lower third of 5: Future stand will be multi-aged.

Silvicultural Prescription:

Alt. 2: Remove approximately 70 to 80 percent of the trees over 9 inches DBH. Trees less than 9 inches DBH and 20 to 30 percent of the trees over 9 inches DBH will be retained through the unit in clumps, small groups, and single trees. Their location will be determined by logging system capability. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.

Alt. 3 and upper two-thirds of slope in 5: Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Alt. 4 and lower third of slope in 5: Remove approximately 25 percent of the trees over 9 inches DBH using an upper and lower diameter limit. Trees less than 9 inches DBH and 75 percent of the trees over 9 inches DBH will be retained throughout the unit. This prescription would address wildlife concerns but it would not provide conditions suitable for regenerating spruce and would not be a cost-effective method of harvesting trees.

Possible Future Treatments:

Alt. 2,3,5: Release, possible planting, pre-commercial thinning (upper portion of unit only in Alt. 5).

Alt. 4: Similar entry in 20 to 30 years.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Unit contains Class III (HC6) and Class IV (HC0) headwaters of Mustang Creek (tributary to North Meter Bight Creek) and Nesbitt Creek. Unit is near Mustang Lake. Unit is in area mapped as windthrow-prone; there is concern for stream buffer stability. Tailholds may be necessary within riparian buffers and across Mustang Lake.

Mitigation: Unit excludes sideslopes of Class III streams and provides about 400-foot no harvest buffer adjacent to Mustang Lake. Riparian trees felled for tailholds must be left in place. Western stream buffer is protected by undisturbed stand to the west. Internal stream buffer will be tied into steep-slope buffer and designed to avoid leaving large wind throw-prone trees, but some windthrow is anticipated in this area. Field review indicates that southern portion of unit is less prone to windthrow than northern portion due to slope position (BMPs 12.6, 12.6a). Provide full suspension wherever possible across Class IV streams; at least partial suspension is required (BMPs 13.9, 13.16). F1, F14

Soils/Wetlands

Concern: 5.5 acres of wetlands along the north end. Unit contains very steep slopes and cliffs adjacent to Class III stream.

Mitigation: Review during layout and remove areas with nonproductive soils from unit as required by Forest Plan standards and guidelines. Review during layout to avoid the steep unstable areas. F15

Wildlife/TES Plants

Concern: Southern one-third of unit has a high deer HCI value. There are approximately 7 acres of high probability goshawk nesting habitat (see map). Sandhill cranes use the area.

Mitigation: Implement Forest-wide standards and guidelines if a goshawk nest is found. Avoid road construction and logging activities between April 1 and June 15 to limit impacts to sandhill cranes. W1, W4, W6, W9, W11, W19

Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway route.

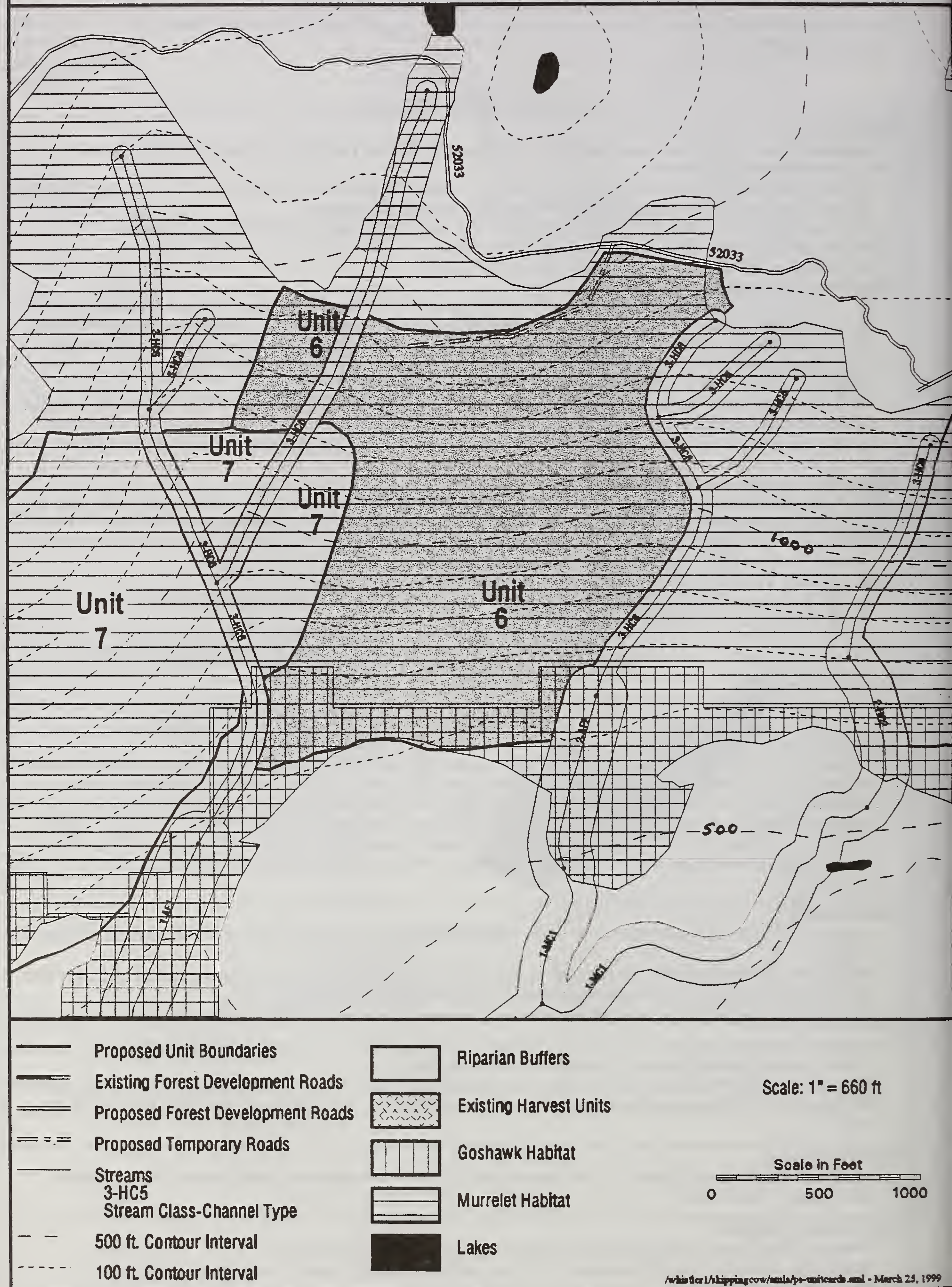
Mitigation: None needed.

Other Resources/Issues

Concern: Stand is in a wind-prone area. Blowdown along the edge is a concern.

Mitigation: Leave an irregular boundary on the east and north edge to create a feathered effect. O1

SKIPPING COW TIMBER HARVEST UNIT 6, ALTS: 2,3,4,5 - 83 ACRES



SKIPPING COW TIMBER SALE - UNIT CARD Unit 6 In Alternatives 2, 3, 4, 5

Harvest Method: Alt. 2: slackline cable, Alt. 3, 5: live skyline cable, Alt. 4: helicopter
New road construction: Alt. 2, 3, 5
Unit Size: 83 acres

Harvest Volume: Alt. 2 : 1,374 MBF
Alt 3: 1,547 MBF
Alt. 4: 430 MBF
Alt. 5: 1,134 MBF

UNIT DEVELOPMENT

Stand Type:

Upper portion: wind-prone area. Trees over 150 years. **Lower portion:** gap phase blowdown area.

Stand Management Objectives:

Alt. 2: Future stand to have two or more canopy layers. Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.

Alt 3 and upper two-thirds of 5: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Alt. 4 and lower third of 5: Future stand will be multi-aged.

Silvicultural Prescription:

Alt. 2: Remove approximately 70 to 80 percent of the trees over 9 inches DBH. Trees less than 9 inches DBH and 20 to 30 percent of the trees over 9 inches DBH will be retained through the unit in clumps, small groups, and single trees. Their location will be determined by logging system capability. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.

Alt. 3, and upper two-thirds of slope in 5: Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Alt. 4 and lower third of slope in 5: Remove approximately 25 percent of the trees over 9 inches DBH using an upper and lower diameter limit. Trees less than 9 inches DBH and 75 percent of the trees over 9 inches DBH will be retained throughout the unit. This prescription would address wildlife concerns but it would not provide conditions suitable for regenerating spruce and would not be a cost-effective method of harvesting trees.

Possible Future Treatments:

Alt 2,3,5: Possible planting, release, pre-commercial thinning.

Alt. 4: Similar entry in 20 to 30 years.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Unit contains eight Class IV (HC0) streams flowing into Class II (HC2, AF1) headwaters of Nesbitt Creek. Class III (HC6) streams at east and west boundaries. Skyline anchors required in the riparian areas south of the unit to get adequate deflection. Unit is in area mapped as windthrow-prone; there is concern for stream buffer stability.

Mitigation: Unit provides at least 100-foot no harvest buffer adjacent to Class II streams to the east and west, and excludes Class II streams south of unit. Unit excludes sideslopes of Class III streams. Riparian trees felled for tailholds must be left in place. The stream buffers along east and west boundaries are primarily oriented with the prevailing storm winds; there is a minimum of exposed edge that is perpendicular to the wind. Western stream buffer is protected by undisturbed stand to the west. Eastern stream buffer follows topographical breaks, ties into smaller, windfirm scrub timber, and provides extended width buffer at southeast corner, associated with alluvial fan area. Field review indicates that southern portion of unit is less prone to windthrow than northern portion due to slope position (BMPs 12.6, 12.6a). Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F14

Soils/Wetlands

Concern: 6.5 acres of wetlands in the northeast corner.

Mitigation: Review during layout and remove areas with nonproductive soils from unit as required by Forest Plan standards and guidelines. O2

Wildlife/TES Plants

Concern: Southern one-quarter of unit has a high deer HCI value. There are approximately 8 acres of high probability goshawk nesting habitat (see map). There is a potential wildlife corridor along the stream in the northwest.

Mitigation: Implement Forest-wide standards and guidelines if a goshawk nest is found. Retain unmerchantable trees along stream. W1, W4, W6, W9, W11

Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway route.

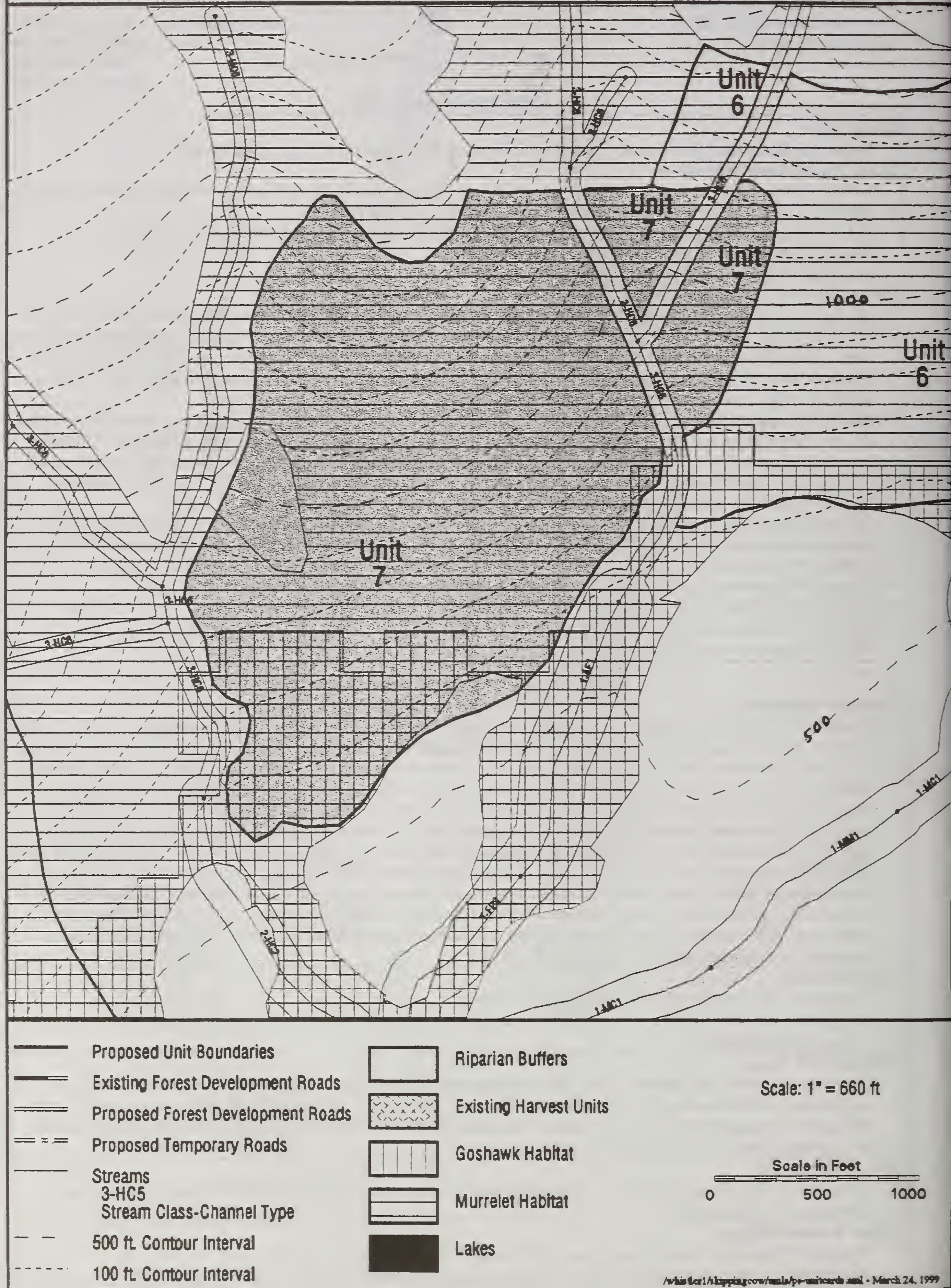
Mitigation: None needed.

Other Resources/Issues

Concern: Stand is in a wind-prone area. Blowdown along the edge is a concern.

Mitigation: Leave an irregular boundary on the east and north edge to create a feathered effect. O1

SKIPPING COW TIMBER HARVEST UNIT 7, ALT: 4 - 123 ACRES



Harvest Method: Helicopter
No new road construction
Unit Size: 123 acres

Harvest Volume: 1,187 MBF

UNIT DEVELOPMENT

Stand Type:
Wind-prone area. The upper 20 to 25 percent of the unit is young-growth sawtimber over 9 inches DBH but less than 150 years old. The remainder is over 150 years old, probably resulting from a windthrow event 250 years ago.

Stand Management Objectives:
Multi-aged stand.

Silvicultural Prescription:
Remove 25 percent of the trees over 9 inches DBH using upper and lower diameter limits. Trees less than 9 inches DBH and 75 percent of the trees over 9 inches DBH will be retained throughout the unit. This prescription would address wildlife concerns but it would not provide conditions suitable for regenerating spruce and would not be a cost-effective method of harvesting trees.

Possible Future Treatments:
Similar entry in 20 to 30 years.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: A Class III (HC6) stream is near the western boundary that becomes Class II near the southeast corner of the unit. Two Class III (HC6) streams are located in the northeastern corner of the unit. A Class I stream is located to the southeast of the unit. Verify buffer widths during layout.

Mitigation: No timber harvest within notch of Class III stream. Fisheries specialist will assist with buffer layout along Class I and II streams. Provide a reasonable assurance of a windfirm buffer. F1

Soils/Wetlands

Concern: 0.8 acre wet and Kushnehin soil along the southeast edge of the unit.

Mitigation: None needed.

Wildlife/TES Plants

Concern: The southeastern one-third of the unit has a high deer HCI value. There are approximately 20 acres of high probability goshawk nesting habitat (see map). There is a potential wildlife corridor along stream (Nesbitt Creek) in eastern one-third of the unit. Sandhill cranes use the area.

Mitigation: Retaining 75 percent of the trees over 9 inches DBH will maintain wildlife values. Avoid road construction and logging activities between April 1 and June 15 to limit impacts to sandhill cranes. Implement Forest-wide standards and guidelines if a goshawk nest is found. W6, W11, W19, W33

Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway route.

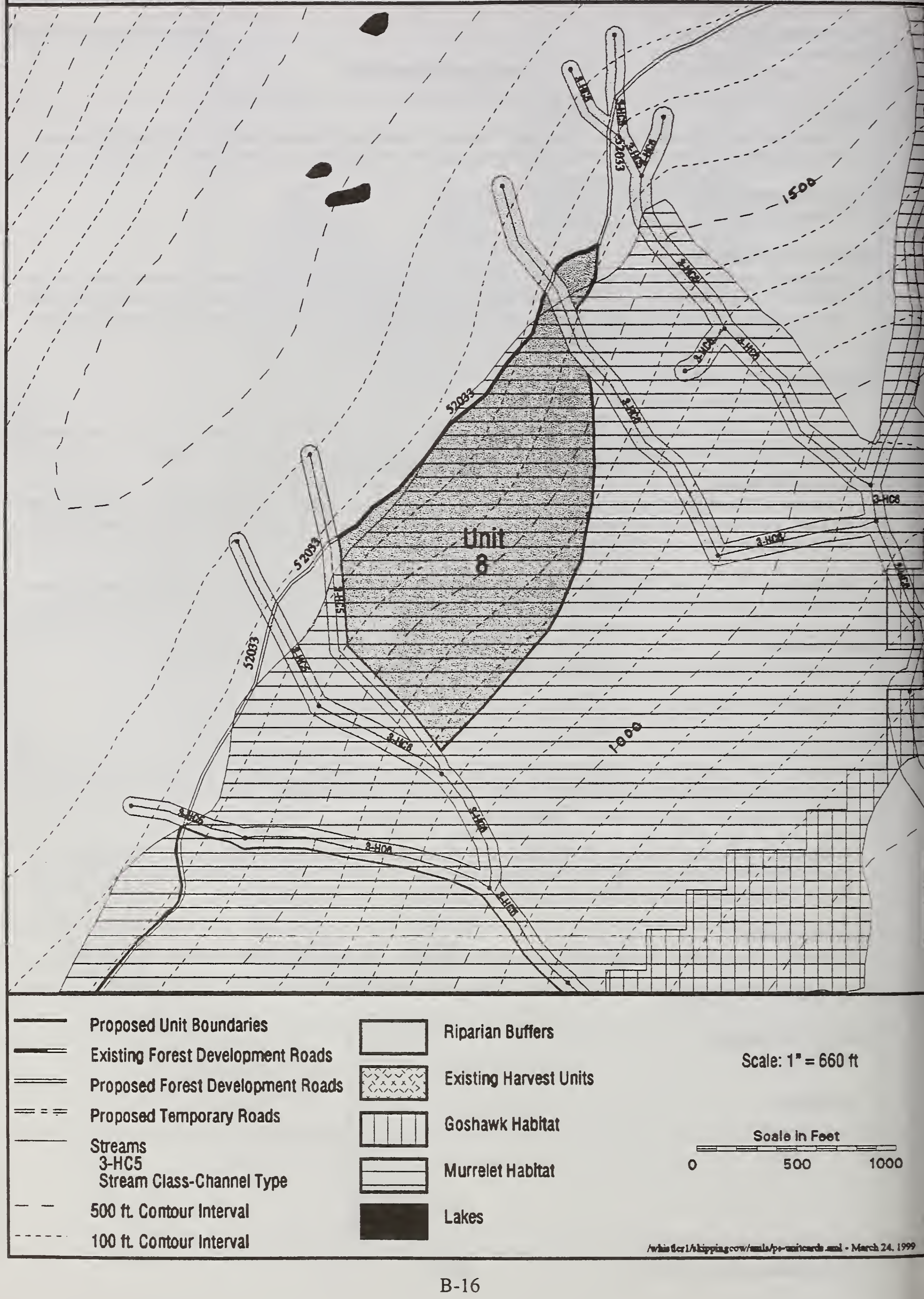
Mitigation: None needed.

Other Resources/Issues

Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 8, ALTS: 2,3 - 40 ACRES



Harvest Method: Alt. 2: running skyline cable, Alt. 3: highlead cable (uphill)
New road construction: Alt. 2, 3
Harvest Volume: Alt. 2: 1,175 MBF
Alt. 3: 1,321 MBF
Unit Size: 40

UNIT DEVELOPMENT

Stand Type:
Wind-prone area. The upper 65 percent of the unit is young-growth sawtimber over 9 inches DBH but less than 150 years old. The remainder is over 150 years old, probably resulting from a windthrow event 250 years ago.

Stand Management Objectives:
Alt. 2: Future stand to have two or more canopy layers. Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.
Alt. 3: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Alt. 2: Remove 70 to 80 percent of the basal area. Trees less than 9 inches DBH and 20 to 30 percent of the trees over 9 inches DBH will be retained through the unit in clumps, small groups, and single trees. Their location will be determined by logging system capability. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.
Alt. 3: Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thin.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries
Concern: Class III (HC5 and HC6) streams in northeast and southwestern portions of unit.

Mitigation: No timber harvest within notch of Class III stream. Provide a reasonable assurance of a windfirm buffer. F1, F14

Soils/Wetlands
Concern:

Mitigation:

Wildlife/TES Plants
Concern: There is a potential wildlife corridor along stream on southwest border of the unit.

Mitigation: Retain all non-merchantable trees and occasional large merchantable trees along length of stream on southwest border of unit. W1, W4, W9, W33

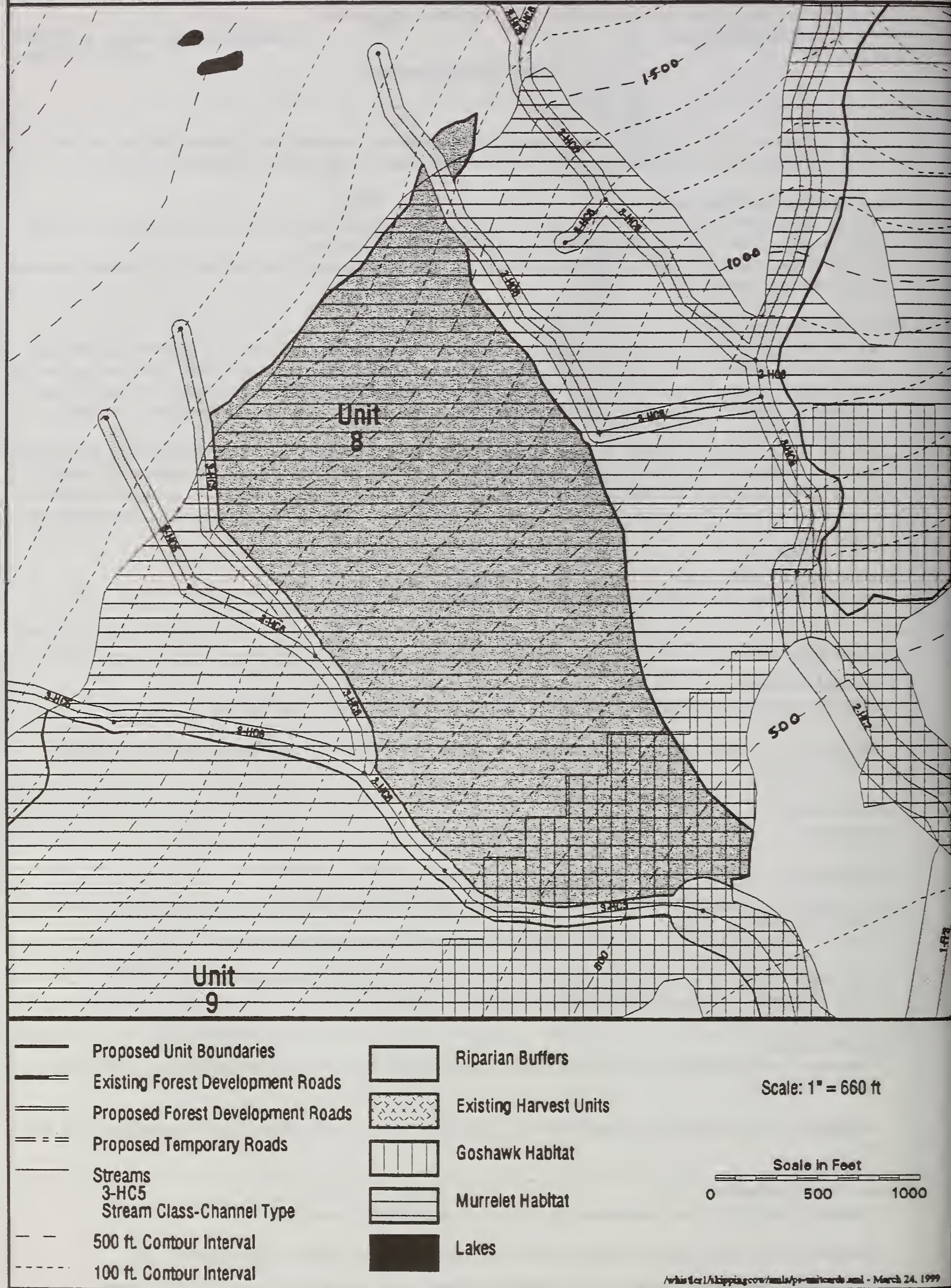
Visual/Recreation
Concern: Visual Quality Objectives = Maximum Modification. Upper two-thirds of unit visible from Alaska Marine Highway.

Mitigation: Vary edges and backlines of unit to give the unit a more natural shape. Avoid straight lines. V1, V4, V8

Other Resources/Issues
Concern: Stand is in a wind-prone area. Blowdown along the edge is a concern.

Mitigation: Leave an irregular boundary on the east and north edge to create a feathered effect. O1

SKIPPING COW TIMBER HARVEST UNIT 8, ALT: 4 - 111 ACRES



Harvest Method: Helicopter
No new road construction
Unit Size: 111 acres

Harvest Volume: 905 MBF

UNIT DEVELOPMENT

Stand Type:
Wind-prone area. The upper 30 to 35 percent of the unit is young-growth sawtimber over 9 inches DBH but less than 150 years old. The remainder is over 150 years old, probably resulting from a windthrow event 250 years ago.

Stand Management Objectives:
Multi-aged stand.

Silvicultural Prescription:
Remove 25 percent of the trees over 9 inches DBH using upper and lower diameter limits. Trees less than 9 inches DBH and 75 percent of the trees over 9 inches DBH will be retained throughout the unit. This prescription would address wildlife concerns but it would not provide conditions suitable for regenerating spruce and would not be a cost-effective method of harvesting trees.

Possible Future Treatments:
Similar entry in 20 to 30 years.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries
Concern: Class III (HC6) streams are located along the northeast and south/southwest boundaries and within the unit. Class III stream along south boundary becomes a Class I (AF1) stream near southeast corner.

Mitigation: No timber harvest within notch of Class III streams. Confirm buffer width on Class I stream during layout. Provide a reasonable assurance of a windfirm buffer. F1

Soils/Wetlands
Concern: 1 acre wetland along the southeast edge of the unit.
1 acre Kushnehin soil also along the southeast edge.

Mitigation: None needed.

Wildlife/TES Plants
Concern: There is a potential wildlife corridor along the stream on the southwest border of the unit. There are approximately 16 acres of probable goshawk nesting habitat (see map).

Mitigation: Retaining 75 percent of the trees over 9 inches DBH will maintain wildlife values. Implement Forest-wide standards and guidelines if a goshawk nest is found. W6, W11, W33

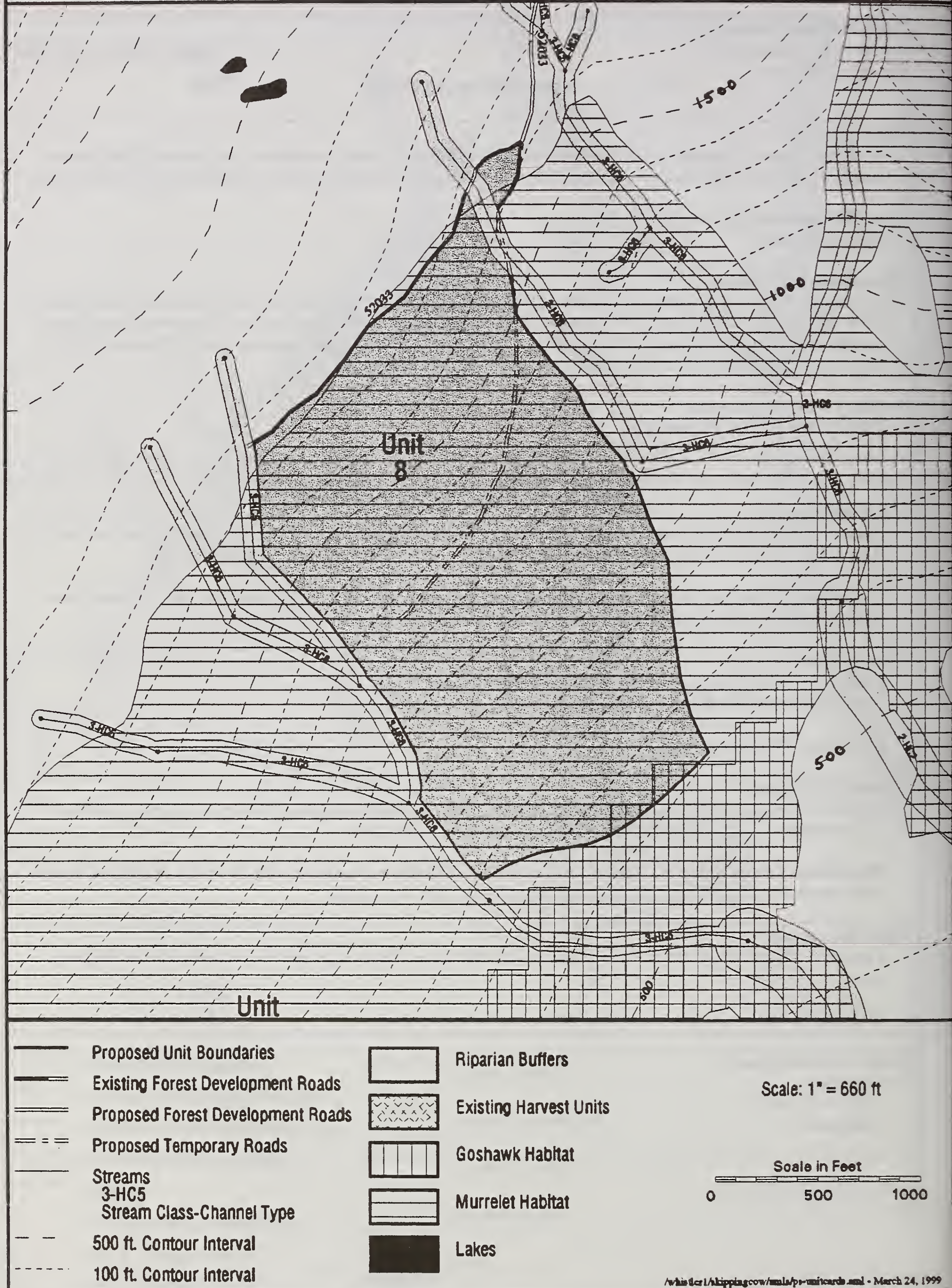
Visual/Recreation
Concern: Visual Quality Objective = Maximum Modification. Upper edge seen from Alaska Marine Highway route.

Mitigation: V6

Other Resources/Issues
Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 8, ALT: 5 - 95 ACRES



Harvest Method: Live skyline and highlead cable
New road construction
Unit Size: 95 acres

Harvest Volume: 2,960 MBF

UNIT DEVELOPMENT

Stand Type:
Wind-prone area. The upper 30 to 35 percent of the unit is young-growth sawtimber over 9 inches DBH but less than 150 years old. The remainder is over 150 years old, probably resulting from a windthrow event 250 years ago.

Stand Management Objectives:
Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly in the lower third of the slope. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Unit contains seven Class IV (HC0) streams flowing into Class II (AF1) headwaters of Nesbitt Creek. Class III (HC5, HC6) stream at southwest boundary. Skyline anchors required in the riparian areas southeast of the unit to get adequate deflection. Unit is in area mapped as windthrow-prone; there is concern for stream buffer stability.

Mitigation: Unit excludes sideslopes of Class III streams. Riparian trees felled for tailholds must be left in place. Western stream buffer is protected by undisturbed stand to the west. Eastern stream buffer follows topographical breaks, ties into smaller, windfirm scrub timber, and provides extended width buffer at southeast corner. Field review indicates that southern portion of unit is less prone to windthrow than northern portion due to slope position (BMPs 12.6, 12.6a). Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F14

Soils/Wetlands

Concern: 1 acre wetland along the southeast edge of the unit.
1 acre Kushnehin soil also along the southeast edge.

Mitigation: None needed.

Wildlife/TES Plants

Concern: There is a potential wildlife corridor along the stream on the southwest border. There are approximately 2 acres of high probability goshawk nesting habitat (see map).

Mitigation: Implement Forest-wide standards and guidelines if a goshawk nest is found. Retain unmerchantable trees along stream. W1, W9, W11, W33

Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. Upper edge seen from Alaska Marine Highway route.

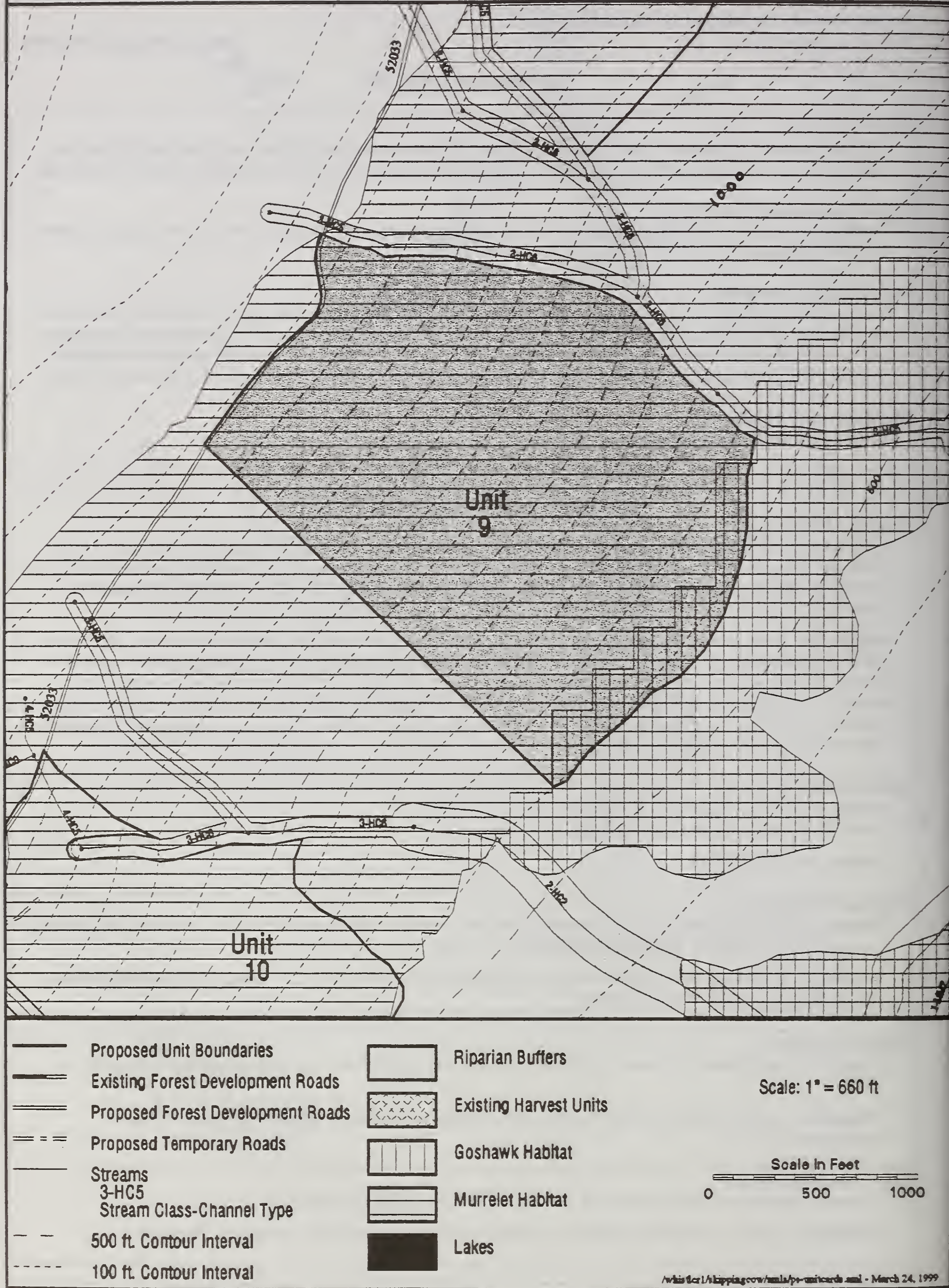
Mitigation: Look for windfirm trees along western boundary in clumps or groups to give a more natural appearance. V1, V8

Other Resources/Issues

Concern: Stand is in a wind-prone area. Blowdown along the edge is a concern.

Mitigation: Leave an irregular boundary on the east and north edge to create a feathered effect. O1

SKIPPING COW TIMBER HARVEST UNIT 9, ALTS: 2,3 - 97 ACRES



Harvest Method: Alt. 2: slackline cable, Alt. 3: Live skyline cable
New road construction: Alt. 2, 3
Unit Size: 97 acres

Harvest Volume: Alt. 2: 2,725 MBF
Alt. 3: 3,066 MBF

UNIT DEVELOPMENT

Stand Type:
Wind-prone area. The upper 30 to 35 percent of the unit is young-growth sawtimber over 9 inches DBH but less than 150 years old. The remainder is over 150 years old, probably resulting from a windthrow event 250 years ago.

Stand Management Objectives:
Alt. 2: Future stand to have two or more canopy layers. Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.
Alt. 3: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Alt. 2: Remove 70 to 80 percent of the trees over 9 inches DBH. Trees less than 9 inches DBH and 20 to 30 percent of the trees over 9 inches DBH will be retained through the unit in clumps, small groups, and single trees. Their location will be determined by logging system capability. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.
Alt. 3: Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thin.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries
Concern: Class III (HC6) stream along northern boundary of unit.

Mitigation: No timber harvest within notch of Class III stream. Provide a reasonable assurance of a windfirm buffer. F1, F14

Soils/Wetlands
Concern:

Mitigation:

Wildlife/TES Plants
Concern: There are approximately 9 acres of high probability goshawk nesting habitat (see map). There is a potential wildlife corridor along stream on the northern border of the unit.

Mitigation: Implement Forest-wide standards and guidelines if a goshawk nest is found. Retain unmerchantable trees along length of stream which forms northern border of unit. W1, W4, W9, W11, W33

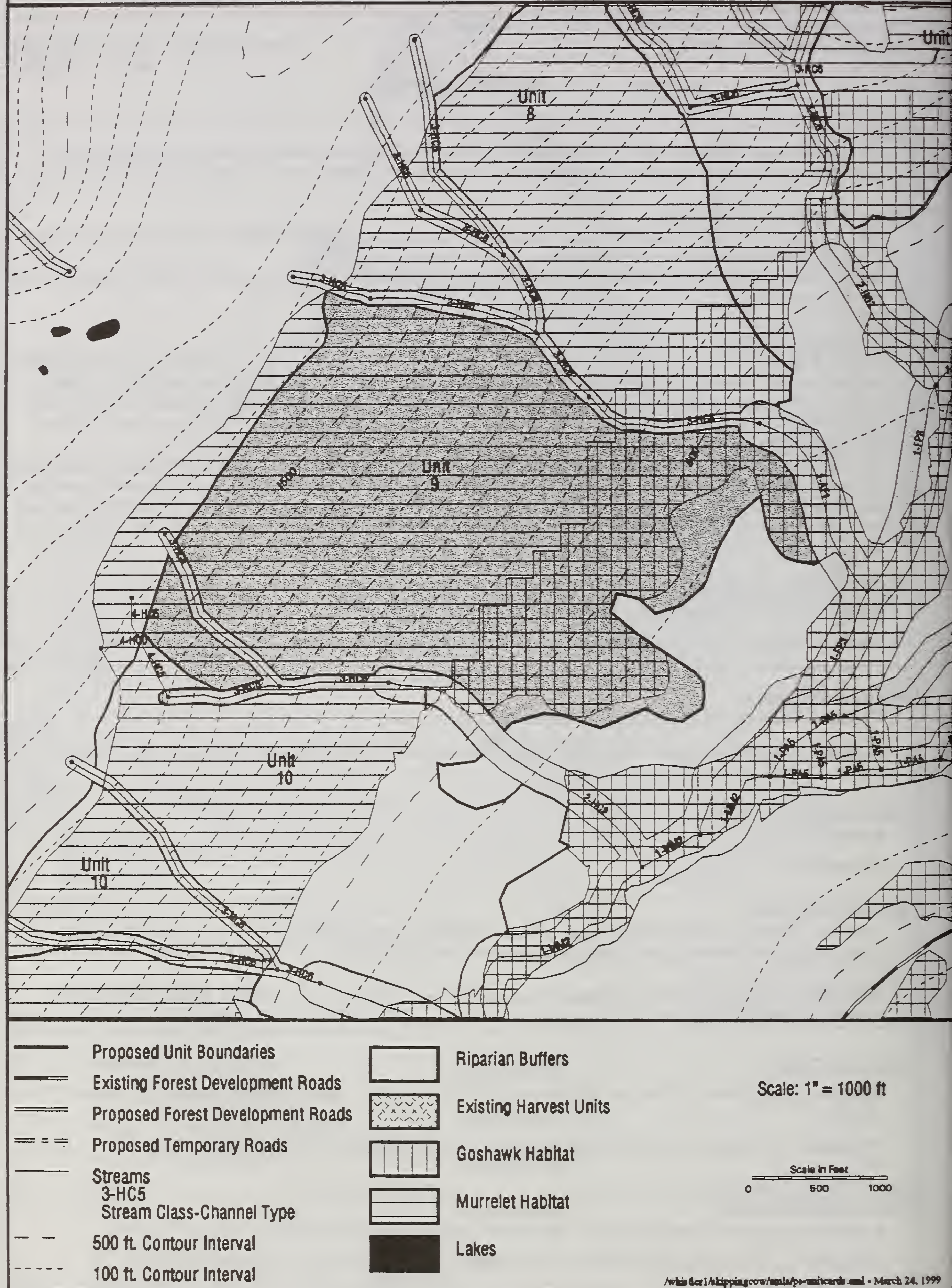
Visual/Recreation
Concern: Visual Quality Objective = Maximum Modification. Upper one-third visible from Alaska Marine Highway.

Mitigation: Vary edges and backlines of unit to give the unit a more natural shape. Avoid straight lines. V1, V4, V8

Other Resources/Issues
Concern: Stand is in a wind-prone area. Blowdown along the edge is a concern.

Mitigation: Leave an irregular boundary on the east and north edge to create a feathered effect. O1

SKIPPING COW TIMBER HARVEST UNIT 9, ALT: 4 - 214 ACRES



SKIPPING COW TIMBER SALE - UNIT CARD Unit 9 In Alternative 4

Harvest Method: Helicopter
No new road construction
Unit Size: 214 acres

Harvest Volume: 1,600 MBF

UNIT DEVELOPMENT

Stand Type:
Wind-prone area. The upper 20 to 25 percent of the unit is young-growth sawtimber over 9 inches DBH but less than 150 years old. The remainder is over 150 years old, probably resulting from a windthrow event 250 years ago.

Stand Management Objectives:
Multi-aged stand.

Silvicultural Prescription:
Remove 25 percent of the trees over 9 inches DBH using upper and lower diameter limits. Trees less than 9 inches DBH and 75 percent of the trees over 9 inches DBH will be retained throughout the unit. This prescription would address wildlife concerns but it would not provide conditions suitable for regenerating spruce and would not be a cost-effective method of harvesting trees.

Possible Future Treatments:
Similar entry in 20 to 30 years.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Three Class III (HC6 and HC5) streams, one on each boundary and one in unit. There is a Class II stream south of the lower boundary of the unit.

Mitigation: No timber harvest within notch of Class III streams. Confirm buffer width on Class II stream during layout. Provide a reasonable assurance of a windfirm buffer. F1

Soils/Wetlands

Concern:

Mitigation:

Wildlife/TES Plants

Concern: There are approximately 60 acres of high probability goshawk nesting habitat. There is a potential wildlife corridor along the stream on the northern boundary and along the stream in the southeast.

Mitigation: Retaining 75 percent of the trees over 9 inches DBH will maintain wildlife values. Implement Forest-wide standards and guidelines if a goshawk nest is found. W6, W11, W33

Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. Upper one-third visible from Alaska Marine Highway.

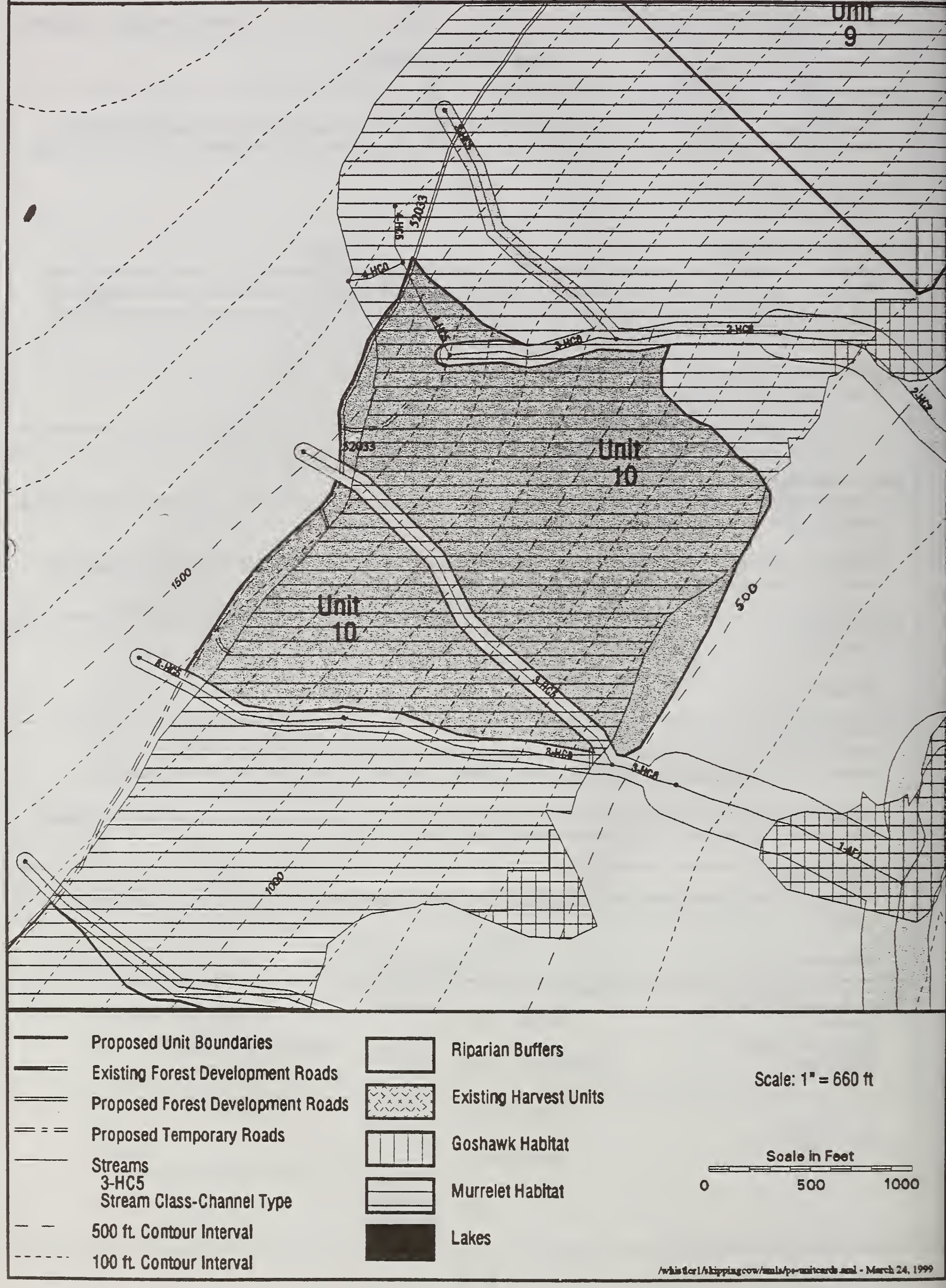
Mitigation: V6

Other Resources/Issues

Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 10, ALTS: 2,3 - 88 ACRES



Harvest Method: Alt. 2: slackline cable, Alt. 3: live skyline
New road construction: Alt. 2, 3
Unit Size: 88 acres

Harvest Volume: Alt. 2: 1,609 MBF
Alt. 3: 1,810 MBF

UNIT DEVELOPMENT

Stand Type:
Wind-prone area. The upper 20 to 25 percent of the unit is young-growth sawtimber over 9 inches DBH but less than 150 years old. The remainder is over 150 years old, probably resulting from a windthrow event 250 years ago.

Stand Management Objectives:
Alt. 2: Future stand to have two or more canopy layers. Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.
Alt. 3: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Alt. 2: Remove approximately 70 to 80 percent of the trees over 9 inches DBH. Trees less than 9 inches DBH and 20 to 30 percent of the trees over 9 inches DBH will be retained through the unit in clumps, small groups, and single trees. Their location will be determined by logging system capability. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.
Alt. 3: Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thin.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries
Concern: Class III streams along southern and northern boundary (HC6) and through unit (HC5).

Mitigation: No timber harvest within notch of Class III streams. Provide a reasonable assurance of a windfirm buffer. F1, F4, F14

Soils/Wetlands
Concern: 0.6 acre of wet soil along the northeast boundary of the unit. Hydric soil at the northwest end, low productivity, 1.5 acres Kushnehin soil in the east portion of the unit.

Mitigation: None needed.

Wildlife/TES Plants
Concern:

Mitigation: W1, W4, W9

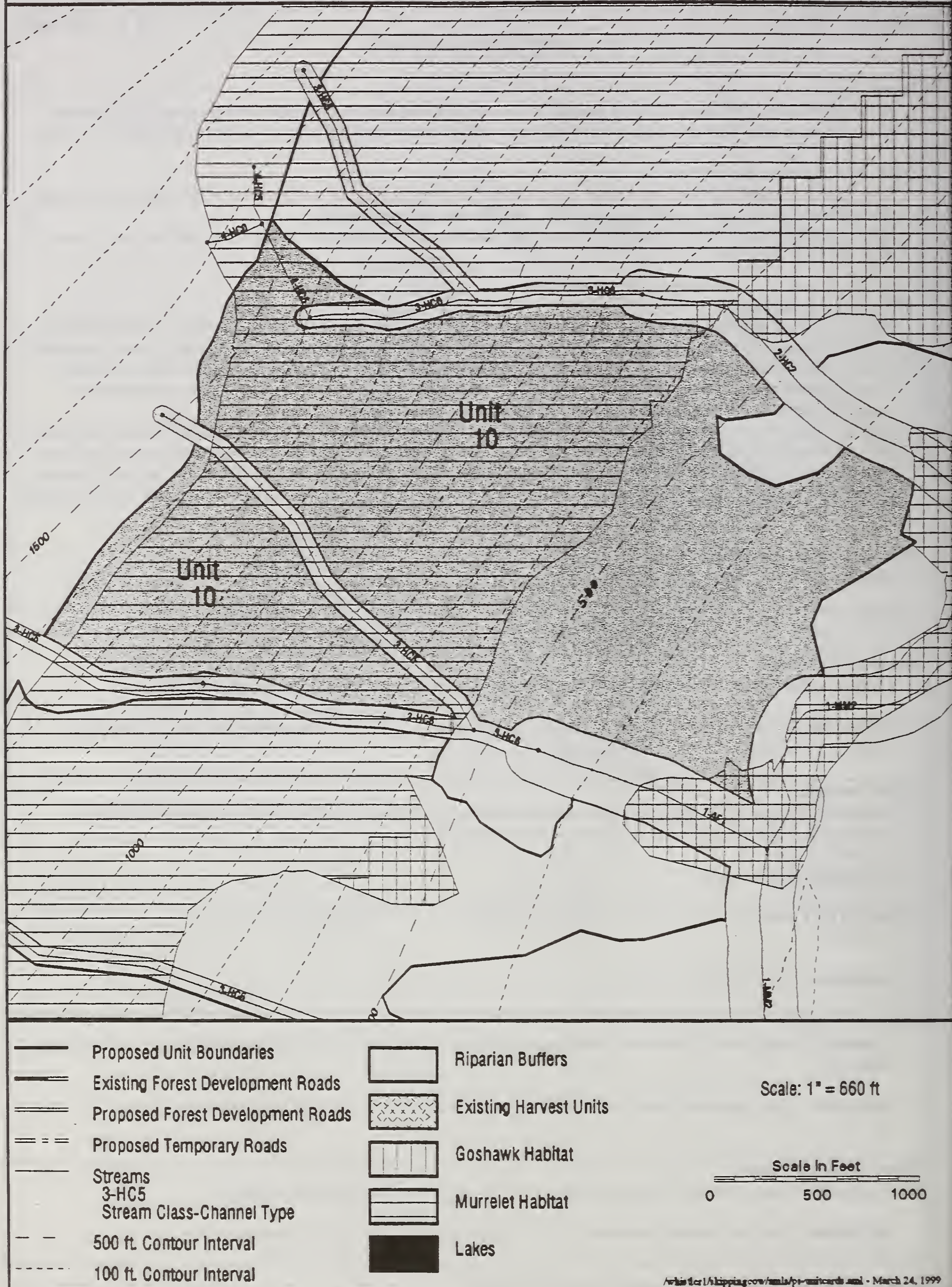
Visual/Recreation
Concern: Visual Quality Objective = Maximum Modification. Upper one-third of unit visible from Alaska Marine Highway.

Mitigation: Vary edges and backlines of unit to give the unit a more natural shape. Avoid straight lines. V1, V4, V8

Other Resources/Issues
Concern: Concern: Stand is in a wind-prone area. Blowdown along the edge is a concern.

Mitigation: Leave an irregular boundary on the east and north edge to create a feathered effect. O1

SKIPPING COW TIMBER HARVEST UNIT 10, ALT: 4 - 144 ACRES



Harvest Method: Helicopter
No new road construction
Unit size: 144 acres

Harvest Volume: 785 MBF

UNIT DEVELOPMENT

Stand Type:
Wind-prone area. The upper 15 percent of the unit is young-growth sawtimber over 9 inches DBH but less than 150 years old. The remainder is over 150 years old, probably resulting from a windthrow event 250 years ago.

Stand Management Objectives:
Multi-aged stand.

Silvicultural Prescription:
Remove 25 percent of the trees over 9 inches DBH using upper and lower diameter limits. Trees less than 9 inches DBH and 75 percent of the trees over 9 inches DBH will be retained throughout the unit. This prescription would address wildlife concerns but it would not provide conditions suitable for regenerating spruce and would not be a cost-effective method of harvesting trees.

Possible Future Treatments:
Similar entry in 20 to 30 years.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Class III streams along southern and northern boundary (HC6) and through unit (HC5).

Mitigation: No timber harvest within notch of Class III streams. Provide a reasonable assurance of a windfirm buffer. F1, F4

Soils/Wetlands

Concern: 0.6 acre of wet soil along the northeast boundary of the unit. Hydric soil at the northwest end, low productivity, 1.5 acres Kushnehin soil in the east portion of the unit.

Mitigation: None needed.

Wildlife/TES Plants

Concern: There is approximately 1 acre of high probability goshawk nesting habitat (see map).

Mitigation: Retaining 75 percent of the trees over 9 inches DBH will maintain wildlife values. Implement Forest-wide standards and guidelines if a goshawk nest is found. W6, W11

Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. Upper one-third of unit visible from Alaska Marine Highway.

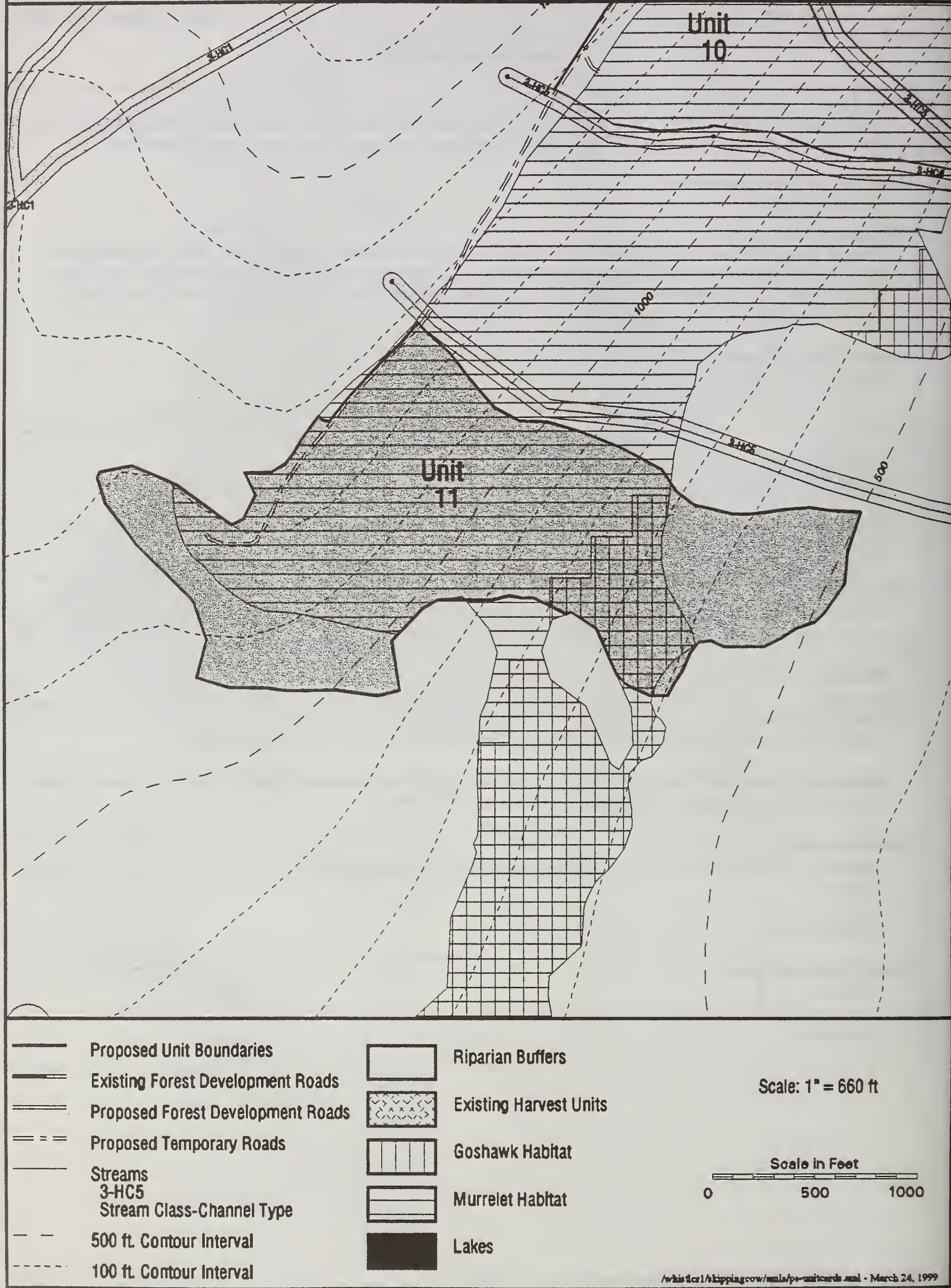
Mitigation: V6

Other Resources/Issues

Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 11, ALTS: 2,3 - 75 ACRES



Harvest Method: Alt. 2: slackline cable, Alt. 3: live skyline cable
New road construction: Alt. 2, 3
Unit Size: 75 acres

Harvest Volume: Alt. 2: 928 MBF
Alt. 3: 1,044 MBF

UNIT DEVELOPMENT

Stand Type:
Wind-prone area. The stand is over 150 years old, probably resulting from a windthrow event 250 years ago.

Stand Management Objectives:
Alt. 2: Future stand to have two or more canopy layers. Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.
Alt. 3: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Alt. 2: Remove 70 to 80 percent of the trees over 9 inches DBH. Trees less than 9 inches DBH and 20 to 30 percent of the trees over 9 inches DBH will be retained through the unit in clumps, small groups, and single trees. Their location will be determined by logging system capability. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.
Alt. 3: Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Release, possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries
Concern: Class III stream outside the unit along the northern boundary (HC6).

Mitigation: No timber harvest within V-notch of Class III streams. Provide a reasonable assurance of a windfirm buffer. F1

Soils/Wetlands
Concern: 10 acres of wet area in the southeast corner of the unit.

Mitigation: Review during layout and remove areas with nonproductive soils from unit as required by Forest Plan standards and guidelines.

Wildlife/TES Plants
Concern: Approximately 8 acres of the unit are goshawk nesting habitat (see map).

Mitigation: Implement Forest-wide standards and guidelines if a goshawk nest is found. W1, W4, W11

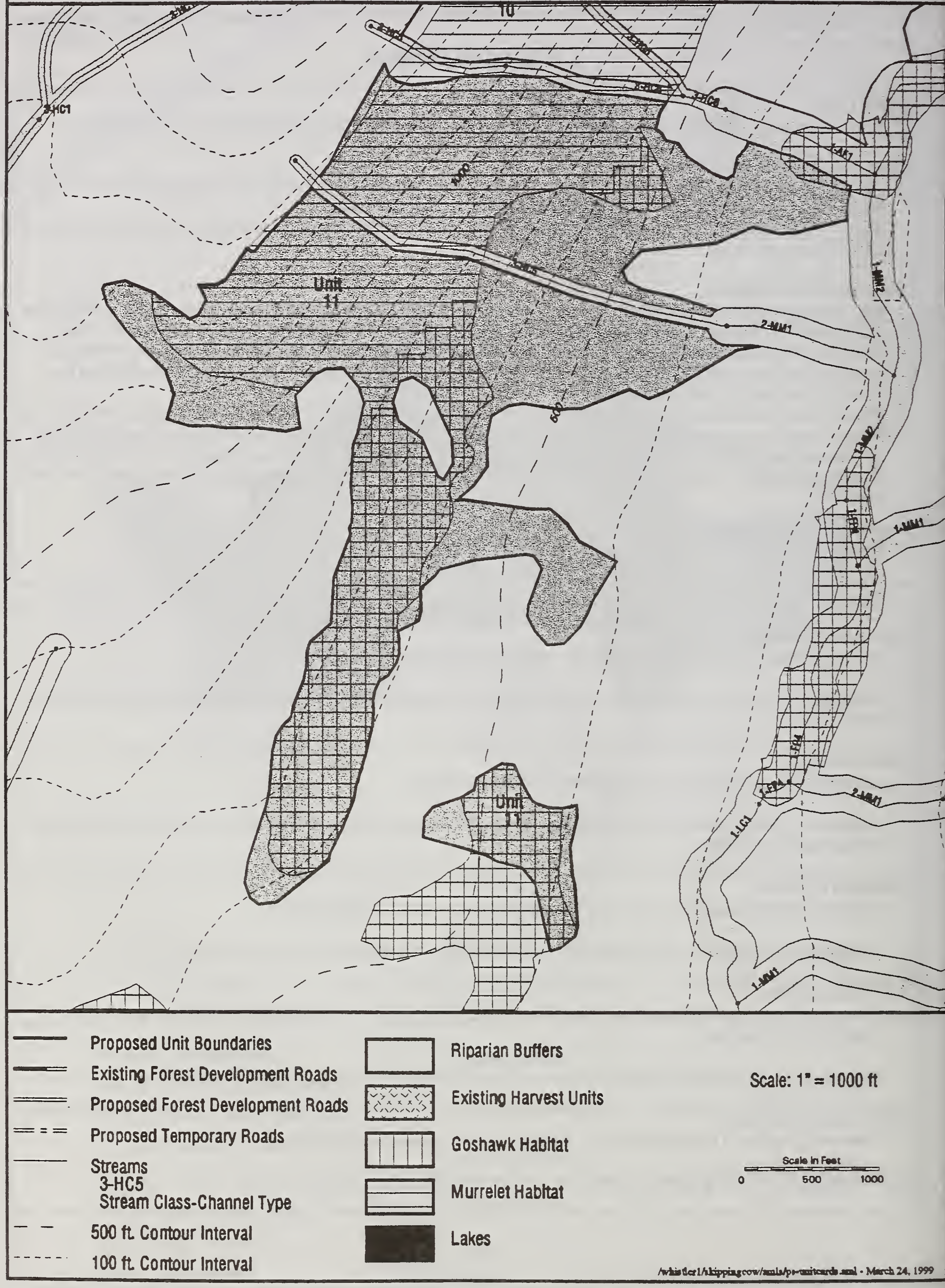
Visual/Recreation
Concern: Visual Quality Objective = Maximum Modification. If clearcut, the upper portion may be seen from Alaska Marine Highway.

Mitigation: Vary edges and backlines to give unit a more natural appearance. Avoid straight edges. V1, V8

Other Resources/Issues
Concern: Stand is in a wind-prone area. Blowdown along the edge is a concern.

Mitigation: Leave an irregular boundary on the east and north edge to create a feathered effect. O1

SKIPPING COW TIMBER HARVEST UNIT 11, ALT: 4 - 271 ACRES



SKIPPING COW TIMBER SALE - UNIT CARD Unit 11 In Alternative 4

Harvest Method: Helicopter
No new road construction
Unit Size: 271

Harvest Volume: 1,322 MBF

UNIT DEVELOPMENT

Stand Type:
Wind-prone area. The stand probably resulted from a windthrow event 250 years ago.

Stand Management Objectives:
Multi-aged stand.

Silvicultural Prescription:
Remove 25 percent of the trees over 9 inches DBH using upper and lower diameter limits. Trees less than 9 inches DBH and 75 percent of the trees over 9 inches DBH will be retained throughout the unit. This prescription would address wildlife concerns but it would not provide conditions suitable for regenerating spruce and would not be a cost-effective method of harvesting trees.

Possible Future Treatments:
Similar entry in 20 to 30 years.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Class III stream along northern boundary (HC6) and in unit (HC5).

Mitigation: No timber harvest within notch of Class III streams. Provide a reasonable assurance of a windfirm buffer. F1

Soils/Wetlands

Concern: 10 acres of wet area in the southeast corner of the unit.

Mitigation: Review during layout and remove areas with nonproductive soils from unit as required by Forest Plan standards and guidelines.

Wildlife/TES Plants

Concern: Approximately 72 acres of the unit are high probability goshawk nesting habitat.

Mitigation: Retaining 25 percent of the trees over 9 inches DBH will maintain wildlife values. Implement Forest-wide standards and guidelines if a goshawk nest is found. W6, W11

Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. Upper one-third of unit visible from Alaska Marine Highway.

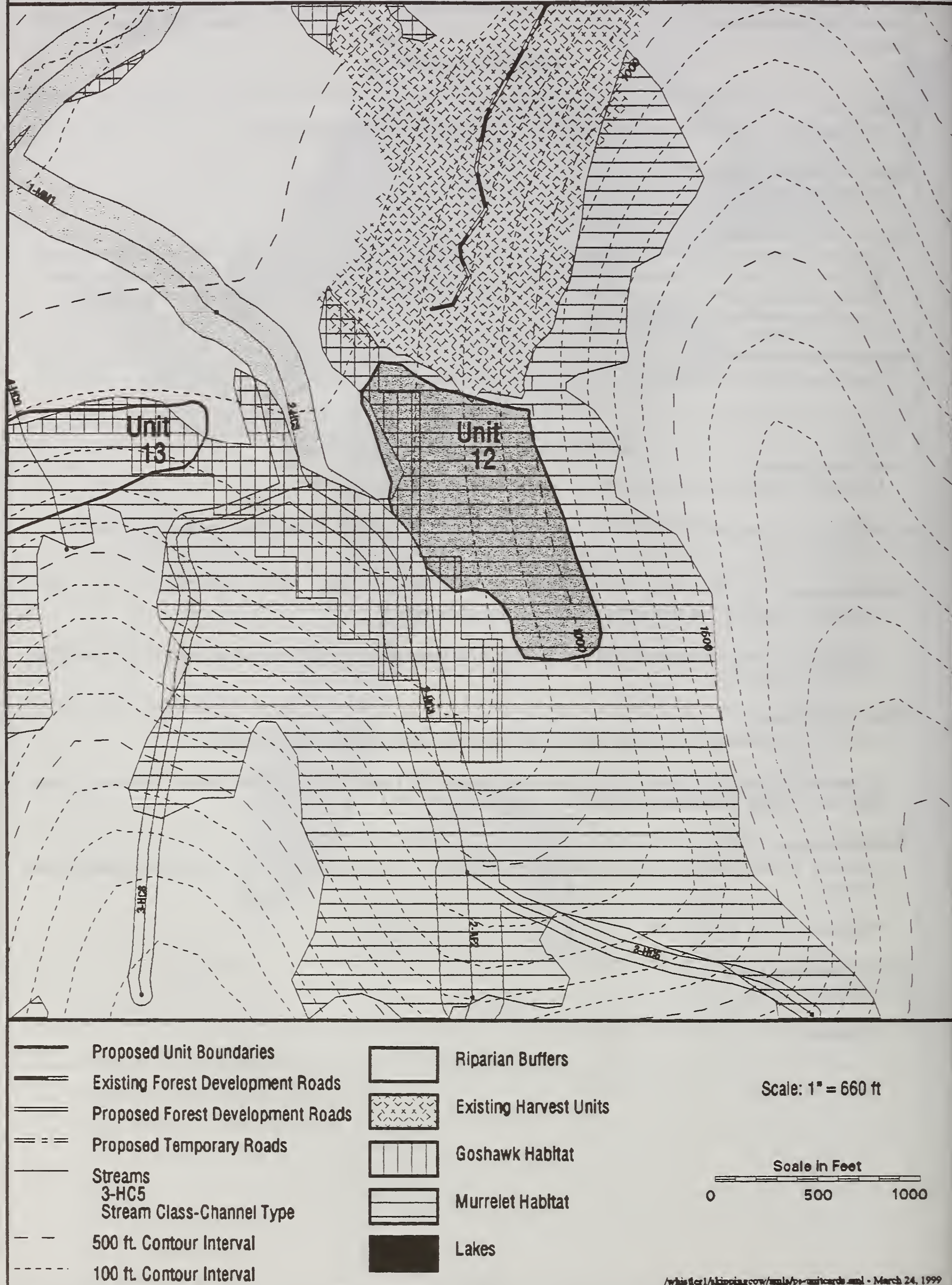
Mitigation: None needed. V6

Other Resources/Issues

Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 12, ALTS: 2,4 - 21 ACRES



SKIPPING COW TIMBER SALE - UNIT CARD   Unit 12   In Alternatives 2, 4

Harvest Method: Alt. 2, 4: helicopter, Alt. 3: downhill cable
No new road construction   Harvest Volume: Alt. 2, 4: 396 MBF
Unit Size: 21 acres

UNIT DEVELOPMENT

Stand Type:
Gap-phase blowdown area. Trees over 150 years old with younger aged trees and seedlings scattered throughout.

Stand Management Objectives:
Future stand to have two or more canopy layers. Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.

Silvicultural Prescription:
Remove 70 to 80 percent of the trees over 9 inches DBH. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.

Possible Future Treatments:
Release, possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: A Class II (HC3) stream is located west of the unit. Verify buffer width during layout.

Mitigation: Fisheries specialist will assist with buffer layout along Class II stream. F1, F15

Soils/Wetlands

Concern: May have MMI 4 soils.

Mitigation: Review in field and remove areas of MMI 4 soils greater than 2 acres.

Wildlife/TES Plants

Concern: There are approximately 20 acres of high probability murrelet nesting habitat and approximately 5 acres of high probability goshawk nesting habitat (see map).

Mitigation: Implement Forest-wide standards and guidelines if a murrelet or goshawk nest is found. Avoid road construction and logging activities between May 1 and June 15 to limit impacts to murrelets. W4, W11, W17

Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway.

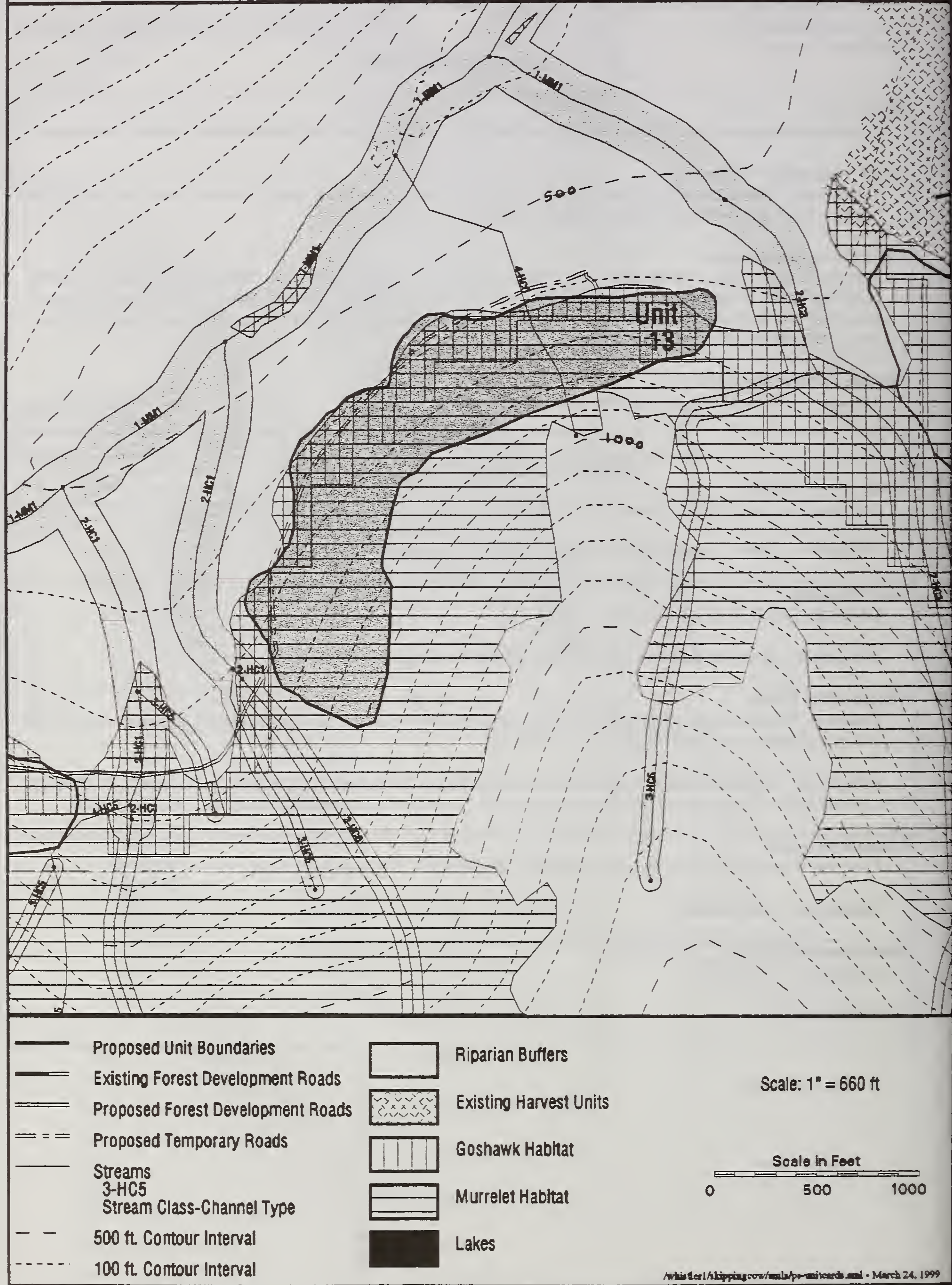
Mitigation: None needed.

Other Resources/Issues

Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 13, ALTS: 2,3,4,5 - 36 ACRES



Harvest Method: Alt. 2, 4: helicopter, Alt. 3, 5: downhill cable
New road construction: Alt. 3, 5
Unit Size: 36 acres

Harvest Volume: Alt. 2, 4: 736 MBF
Alt. 3, 5: 830 MBF

UNIT DEVELOPMENT

Stand Type:
Gap-phase blowdown area. Trees over 150 years old with younger aged trees and seedlings scattered throughout.

Stand Management Objectives:
Alt. 2,4: Future stand to have two or more canopy layers. Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.
Alt. 3,5: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Alt. 2,4: Remove 70 to 80 percent of the trees over 9 inches DBH. Trees less than 9 inches DBH and 20 to 30 percent of the trees over 9 inches DBH will be retained through the unit in clumps, small groups, and single trees. Their location will be determined by logging system capability. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.
Alt. 3,5: Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries
Concern: Unit contains Class IV (HC0) streams flowing into Class I Middle Meter Bight Creek. Class III (HC5, HC6) streams at southwest and northeast unit boundaries.

Mitigation: Unit excludes sideslopes of Class III streams. Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F3, F6, F8, F14, F15

Soils/Wetlands
Concern: Hazardous soil (MMI 4) above unit.

Mitigation: Keep backline below steep, slide-prone slope.

Wildlife/TES Plants
Concern: There are approximately 13 acres of high probability goshawk and approximately 33 acres are high probability marbled murrelet nesting habitat (see map). Southwestern portion of the unit has a high deer HCI value.

Mitigation: Implement Forest-wide standards and guidelines if a goshawk or murrelet nest is found. Avoid road construction and logging activities between May 1 and June 15 to limit impacts to murrelets. W1, W4, W11, W17

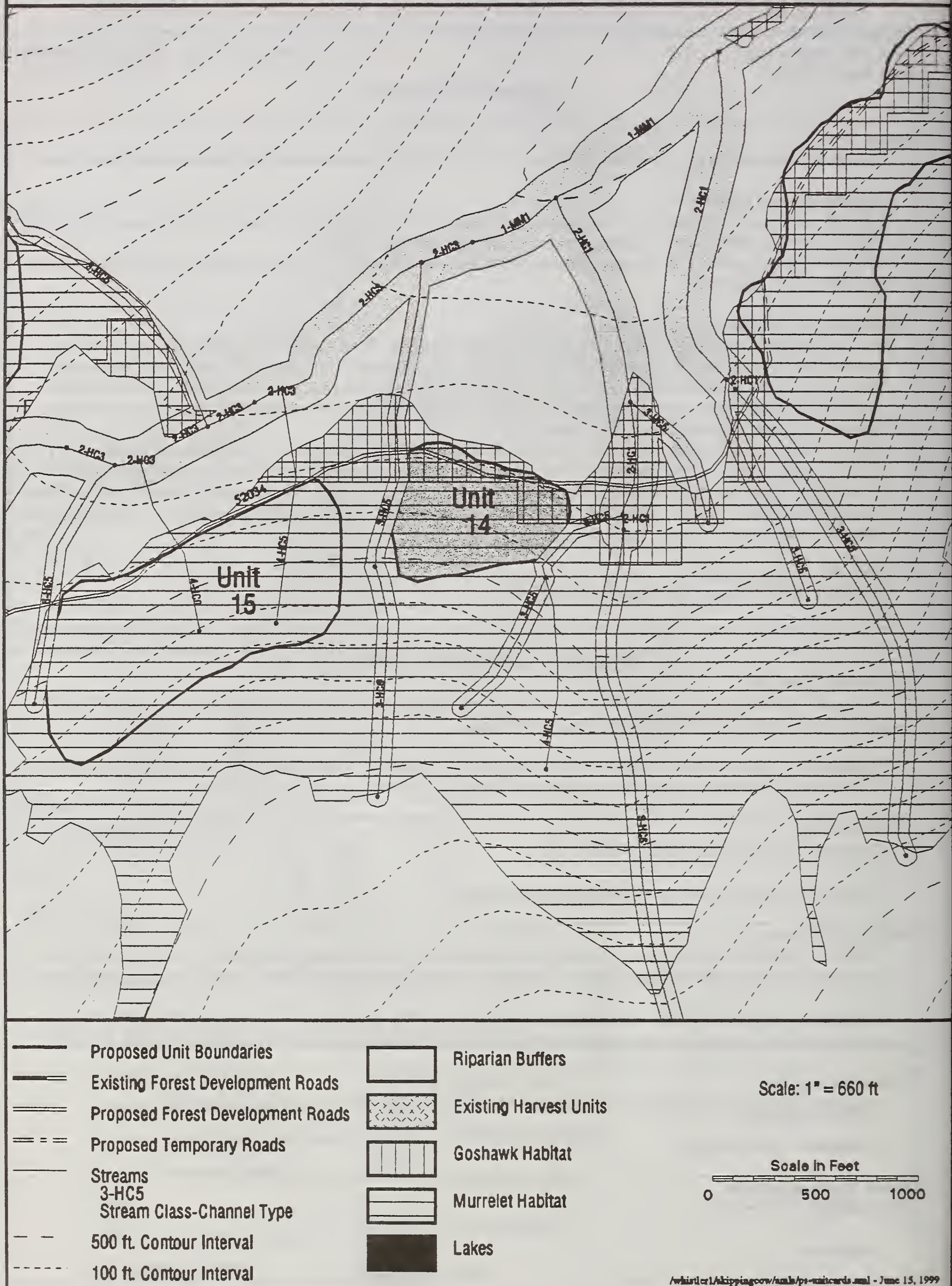
Visual/Recreation
Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway.

Mitigation: None needed.

Other Resources/Issues
Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 14, ALTS: 2,3,4,5 - 10 ACRES



Harvest Method: Alt. 2, 4: helicopter, Alt. 3, 5: downhill cable
New road construction: Alt. 3, 5
Unit Size: 10 acres

Harvest Volume: Alt. 2, 4: 217 MBF
Alt. 3, 5: 244 MBF

UNIT DEVELOPMENT

Stand Type:
Gap-phase blowdown area. Trees over 150 years old with younger aged trees and seedlings scattered throughout.

Stand Management Objectives:
Alt. 2,4: Future stand to have two or more canopy layers. Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.
Alt. 3,5: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Alt. 2,4: Remove 70 to 80 percent of the trees over 9 inches DBH. Trees less than 9 inches DBH and 20 to 30 percent of the trees over 9 inches DBH will be retained through the unit in clumps, small groups, and single trees. Their location will be determined by logging system capability. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.
Alt. 3,5: Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries
Concern: Unit is bounded by Class III (HC5, HC6) streams flowing into Class I Middle Meter Bight Creek. Unit contains a Class IV (HC0) stream.

Mitigation: Unit excludes sideslopes of Class III streams. Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F8, F14, F15

Soils/Wetlands
Concern: Hazardous soil (MMI 4) above unit.

Mitigation: Keep backline below steep, slide-prone slope.

Wildlife/TES Plants
Concern: There are approximately 3 acres of high probability goshawk and 10 acres of high probability marbled murrelet nesting habitat (see map).

Mitigation: Implement Forest-wide standards and guidelines if a goshawk or murrelet nest is found. Avoid road construction and logging activities between May 1 and June 15 to limit impacts to murrelets. W1, W11, W17

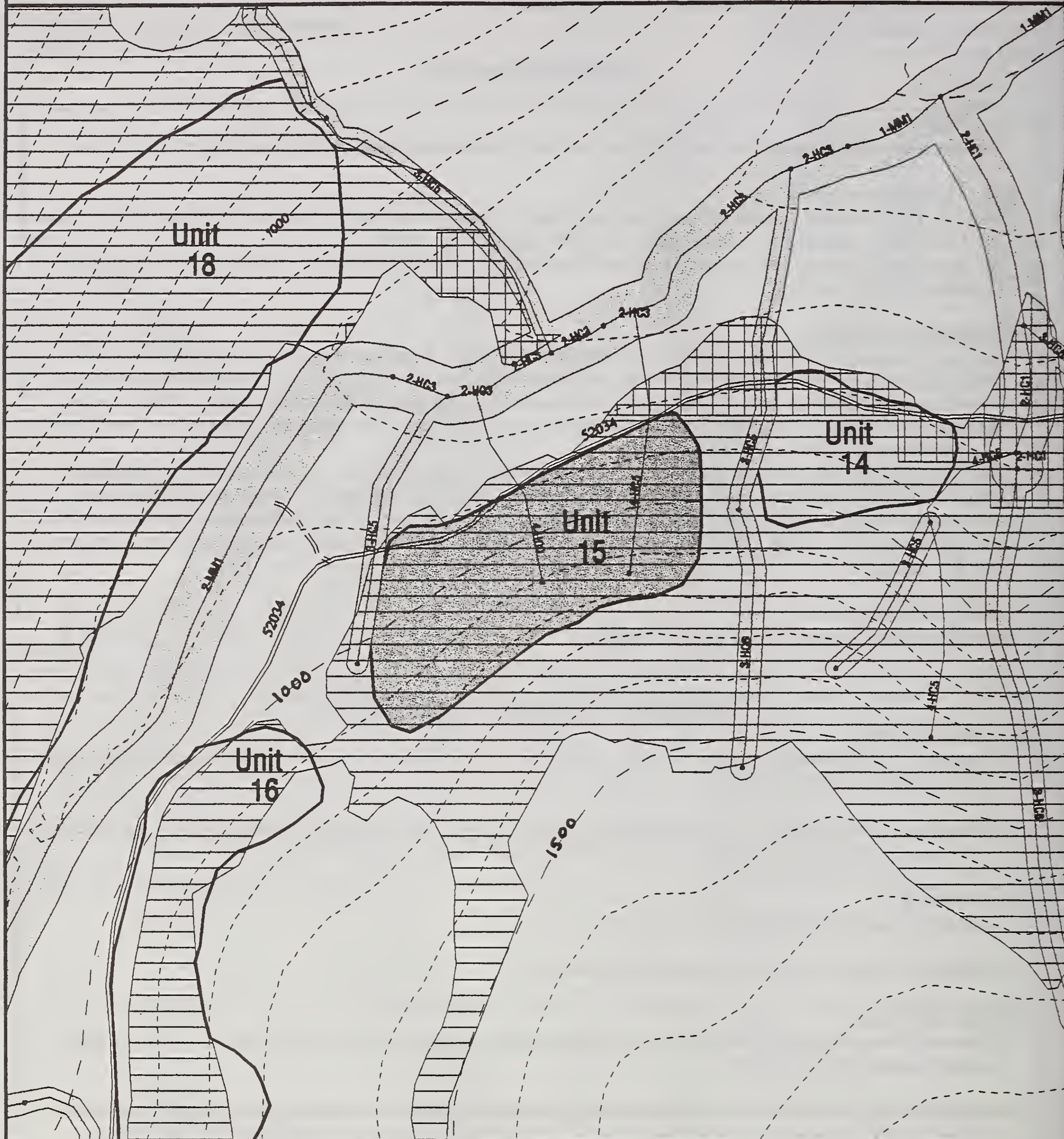
Visual/Recreation
Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway.

Mitigation: None needed.

Other Resources/Issues
Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 15, ALTS: 2,3,4,5 - 24 ACRES



Proposed Unit Boundaries
Existing Forest Development Roads
Proposed Forest Development Roads
Proposed Temporary Roads
Streams
3-HC5
Stream Class-Channel Type
500 ft. Contour Interval
100 ft. Contour Interval

Riparian Buffers
Existing Harvest Units
Goshawk Habitat
Murrelet Habitat
Lakes

Scale: 1" = 660 ft

Scale in Feet
0 500 1000

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SKIPPING COW TIMBER SALE - UNIT CARD Unit 15 In Alternatives 2, 3, 4, 5

Harvest Method: Alt.2, 4: helicopter, Alt. 3, 5: downhill cable
New road construction: Alt. 3, 5
Unit Size: 24 acres

Harvest Volume: Alt. 2, 4: 554 MBF
Alt. 3, 5: 624 MBF

UNIT DEVELOPMENT

Stand Type:
Gap-phase blowdown area. Trees over 150 years old with younger aged trees and seedlings scattered throughout.

Stand Management Objectives:
Alt. 2,4: Future stand to have two or more canopy layers. Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.
Alt. 3,5: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Alt. 2,4: Remove 70 to 80 percent of the trees over 9 inches DBH. Trees less than 9 inches DBH and 20 to 30 percent of the trees over 9 inches DBH will be retained through the unit in clumps, small groups, and single trees. Their location will be determined by logging system capability. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.
Alt. 3,5: Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries
Concern: Unit is bounded by Class III (HC5, HC6) streams flowing into Class I Middle Meter Bight Creek. Unit contains four Class IV (HC0) streams.

Mitigation: Unit excludes sideslopes of Class III streams. Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F4, F8, F14, F15

Soils/Wetlands
Concern: Hazardous soil (MMI 4) above unit.

Mitigation: Keep backline below steep, slide-prone slope.

Wildlife/TES Plants
Concern: There are approximately 24 acres of high probability marbled murrelet nesting habitat (see map).

Mitigation: Implement Forest-wide standards and guidelines if a murrelet nest is found. Avoid road construction and logging activities between May 1 and June 15 to limit impacts to murrelets. W1, W4, W17

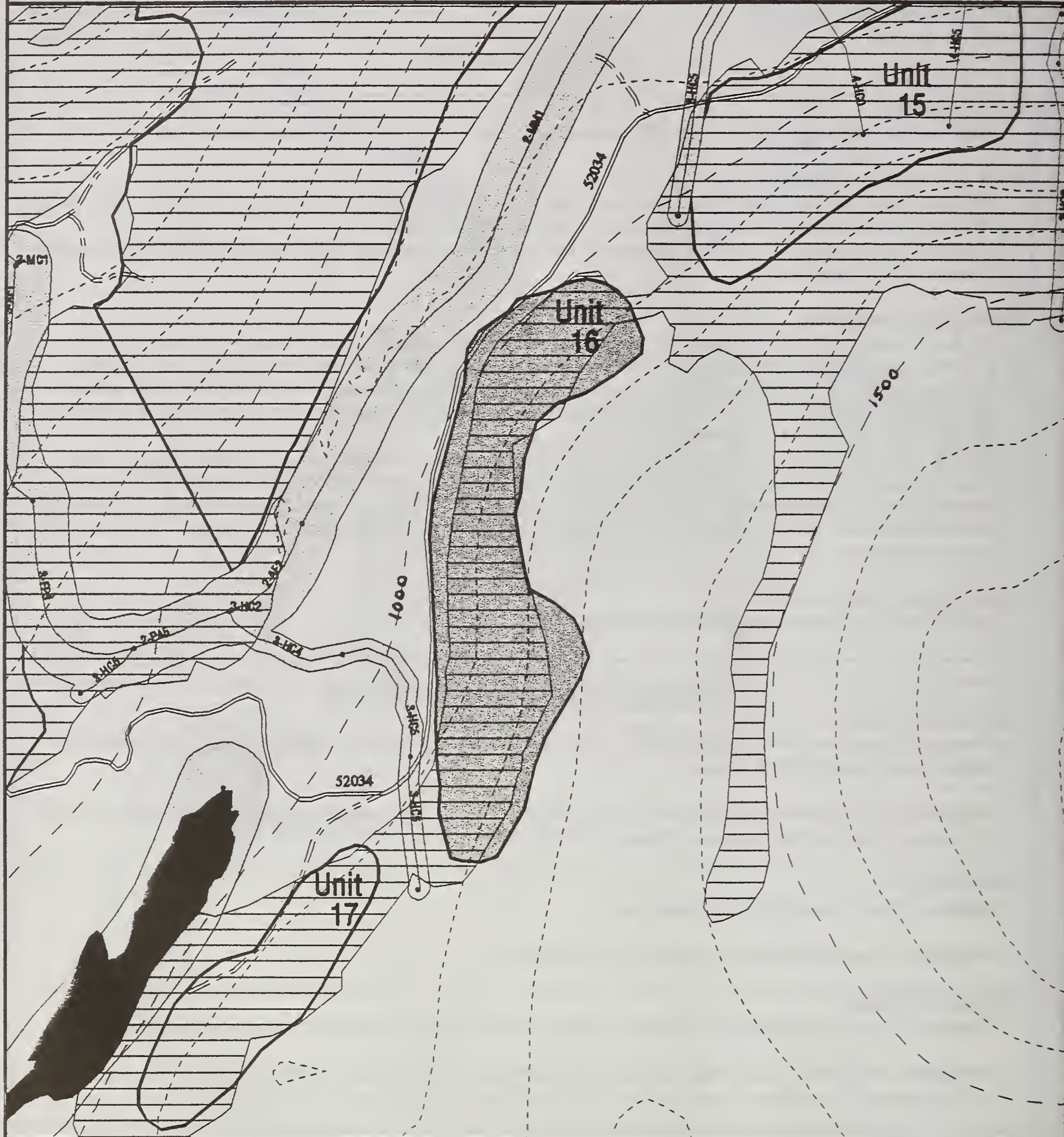
Visual/Recreation
Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway.

Mitigation: None needed.

Other Resources/Issues
Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 16, ALTS: 2,3,4,5 - 27 ACRES



Proposed Unit Boundaries	Riparian Buffers
Existing Forest Development Roads	Existing Harvest Units
Proposed Forest Development Roads	Goshawk Habitat
Proposed Temporary Roads	Murrelet Habitat
Streams 3-HC5 Stream Class-Channel Type	Lakes
500 ft. Contour Interval	
100 ft. Contour Interval	

Scale: 1" = 660 ft

Scale in Feet

0 500 1000

/whistler1/skippingcow/amls/ps-unitcards.aml - March 24, 1999

Harvest Method: Alt. 2, 4: helicopter, Alt. 3, 5: downhill cable
New road construction: Alt. 3, 5
Unit Size: 27 acres

Harvest Volume: Alt. 2, 4: 417MBF
Alt. 3, 5: 469 MBF

UNIT DEVELOPMENT

Stand Type:
Gap-phase blowdown area. Trees over 150 years old with younger aged trees and seedlings scattered throughout.

Stand Management Objectives:
Alt. 2,4: Future stand to have two or more canopy layers. Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.
Alt. 3,5: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Alt. 2,4: Remove 70 to 80 percent of the trees over 9 inches DBH. Trees less than 9 inches DBH and 20 to 30 percent of the trees over 9 inches DBH will be retained through the unit in clumps, small groups, and single trees. Their location will be determined by logging system capability. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.
Alt. 3,5: Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries
Concern: Unit contains one Class IV (HC0) stream flowing into headwaters of Middle Meter Bight Creek.

Mitigation: Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F14

Soils/Wetlands
Concern: Approximately 15 acres wetland soils scattered through the unit.

Mitigation: Review during layout and remove areas with nonproductive soils from unit as required by Forest Plan standards and guidelines. O2

Wildlife/TES Plants
Concern:

Mitigation: W1, W4

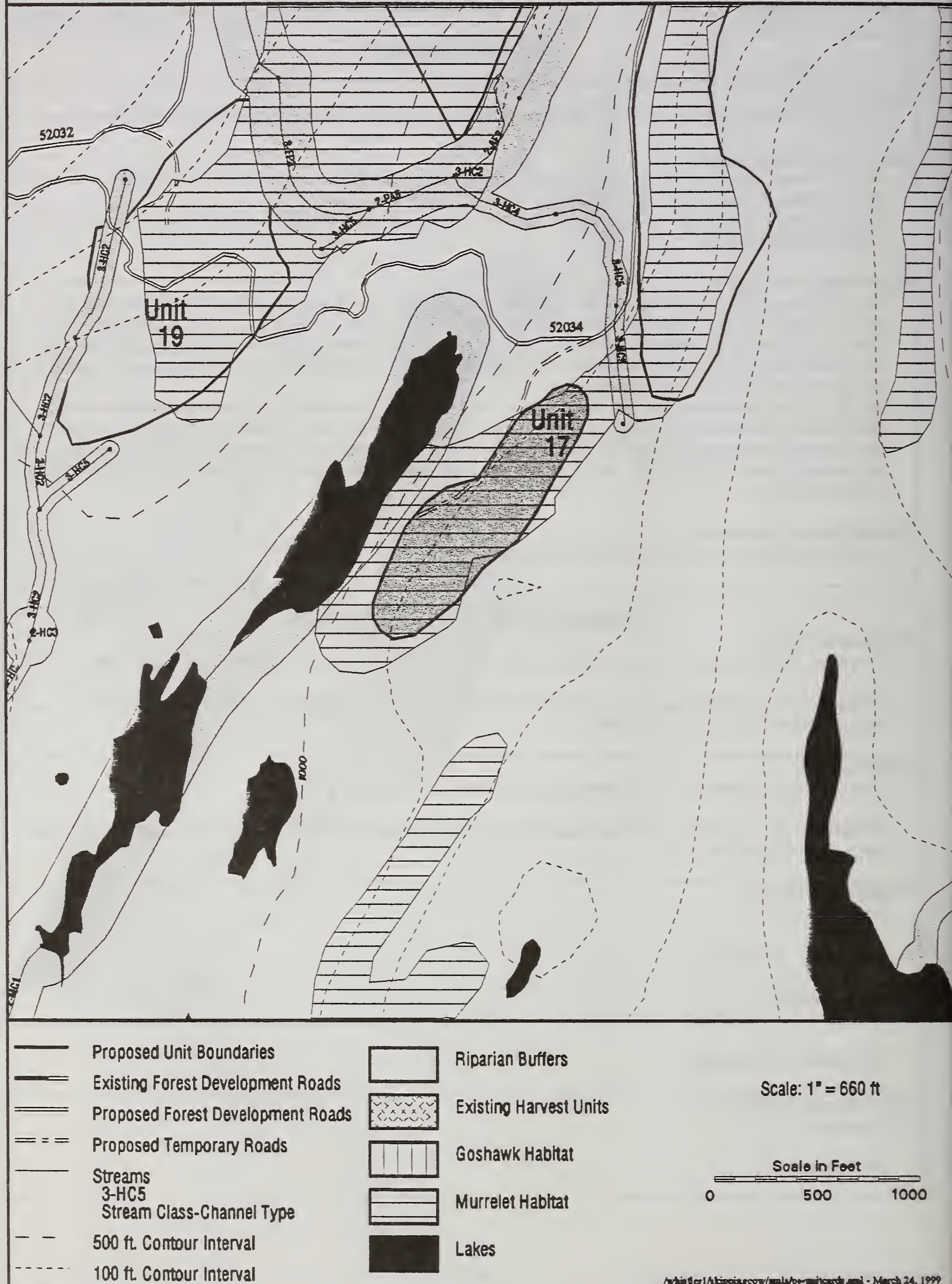
Visual/Recreation
Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway.

Mitigation: None needed.

Other Resources/Issues
Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 17, ALTS: 2,3,4,5 - 11 ACRES



Harvest Method: Alt. 2, 4: helicopter, Alt. 3, 5: downhill cable
New road construction: Alt. 3, 5 Harvest Volume: Alt. 2, 4: 207 MBF
Unit Size: 11 acres Alt. 3, 5: 233 MBF

UNIT DEVELOPMENT

Stand Type:
Gap-phase blowdown area. Trees over 150 years old with younger aged trees and seedlings scattered throughout.

Stand Management Objectives:
Alt. 2,4: Future stand to have two or more canopy layers. Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.
Alt. 3,5: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Alt. 2,4: Remove 70 to 80 percent of the trees over 9 inches DBH. Trees less than 9 inches DBH and 20 to 30 percent of the trees over 9 inches DBH will be retained through the unit in clumps, small groups, and single trees. Their location will be determined by logging system capability. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.
Alt. 3,5: Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries
Concern: Unit contains one Class IV (HC0) stream flowing into headwaters of Vial Creek. Unit is adjacent to lake.

Mitigation: Unit provides at least 100-foot no harvest buffer adjacent to lake (BMPs 12.6, 12.6a). Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1

Soils/Wetlands
Concern: 1 acre of wetland in the north portion of the unit.

Mitigation: None needed.

Wildlife/TES Plants
Concern:

Mitigation: W1, W4

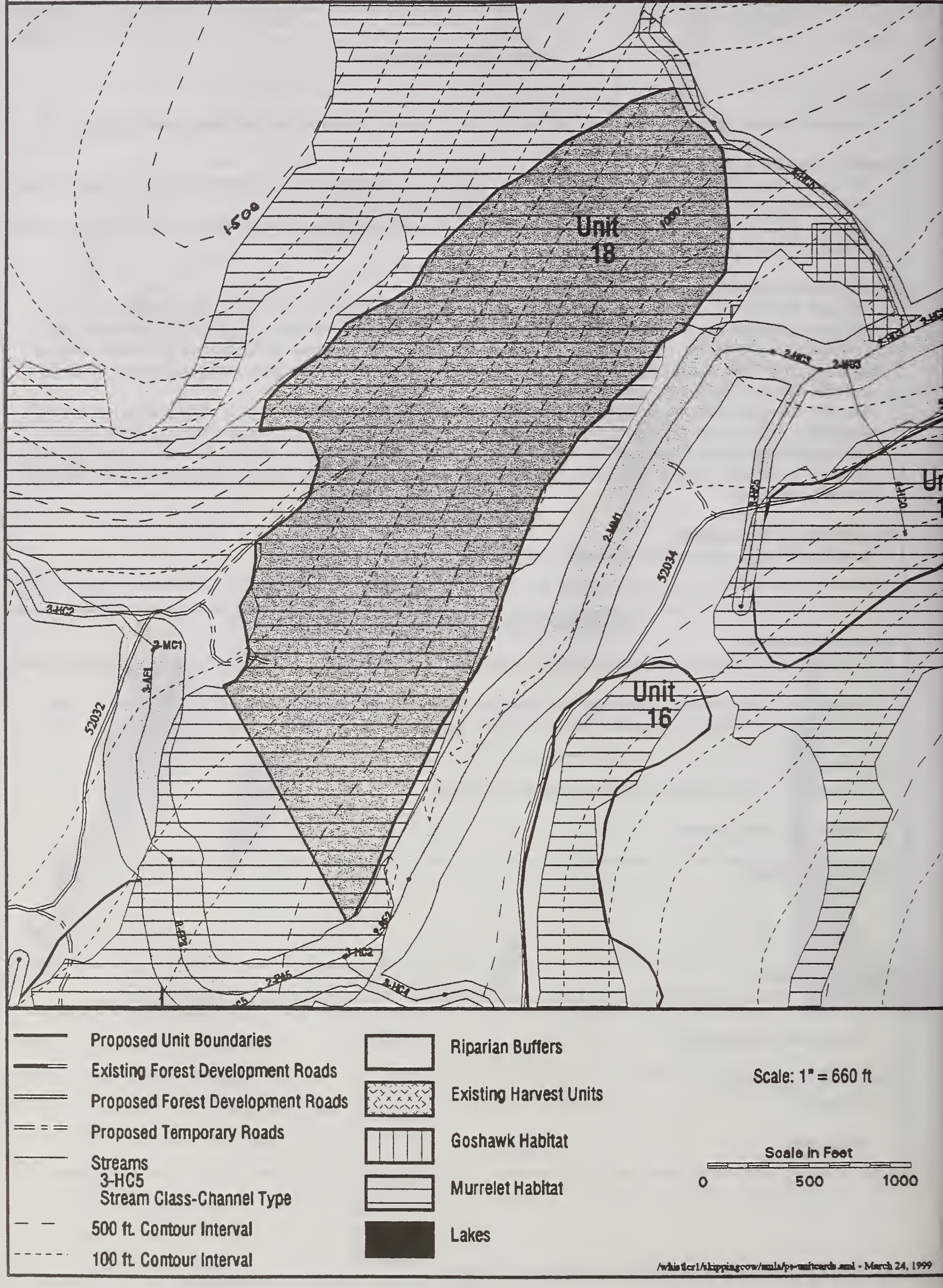
Visual/Recreation
Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway.

Mitigation: None needed.

Other Resources/Issues
Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 18, ALTS: 2,3,4,5 - 100 ACRES



Harvest Method: Alt. 2, 4: eastern 38 acres are helicopter, remainder is running skyline, Alt. 3, 5: running skyline
New road construction — Harvest Volume: Alt. 2: 1,989 MBF
Unit Size: 100 acres — Alt. 3, 4, 5: 2,237 MBF

UNIT DEVELOPMENT

Stand Type:
Wind-prone area. Trees over 150 years old with pockets of younger aged trees and areas of stand initiation.

Stand Management Objectives:
Alt. 2: Future stand to have two or more canopy layers. Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.
Alt. 3,4,5: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Alt. 2: Remove 70 to 80 percent of the trees over 9 inches DBH. Trees less than 9 inches DBH and 20 to 30 percent of the trees over 9 inches DBH will be retained through the unit in clumps, small groups, and single trees. Their location will be determined by logging system capability. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.
Alt. 3,4,5: Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines, except in Alt. 5, where they will be mostly in the lower third of the slope. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries
Concern: Unit is adjacent to Class II (MM1) Middle Meter Bight Creek, Class III (HC6) tributary at northeast, contains several Class IV (HC0) tributaries. Logging plan calls for yarding from spur road south of (across) Middle Meter Bight Creek. Unit is in area mapped at windthrow-prone; there is concern for stream buffer stability.

Mitigation: Unit provides at least 120-foot no harvest buffer adjacent to Middle Meter Bight Creek. This buffer is parallel to predominant wind direction and expected to be relatively windfirm. Profiles in slackline setting indicate full suspension across Middle Meter Bight is possible. ***Consult fisheries specialist*** during designation of yarding corridors and development of streamcourse protection plan. Unit excludes sideslopes of Class III stream. This buffer is perpendicular to dominant wind direction and ***requires additional field review*** for buffer stability (BMPs 12.6, 12.6a). Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F14, F15

Soils/Wetlands
Concern: Steep slope above unit.

Mitigation: Keep backline below steep slope.

Wildlife/TES Plants
Concern:

Mitigation: W1, W4

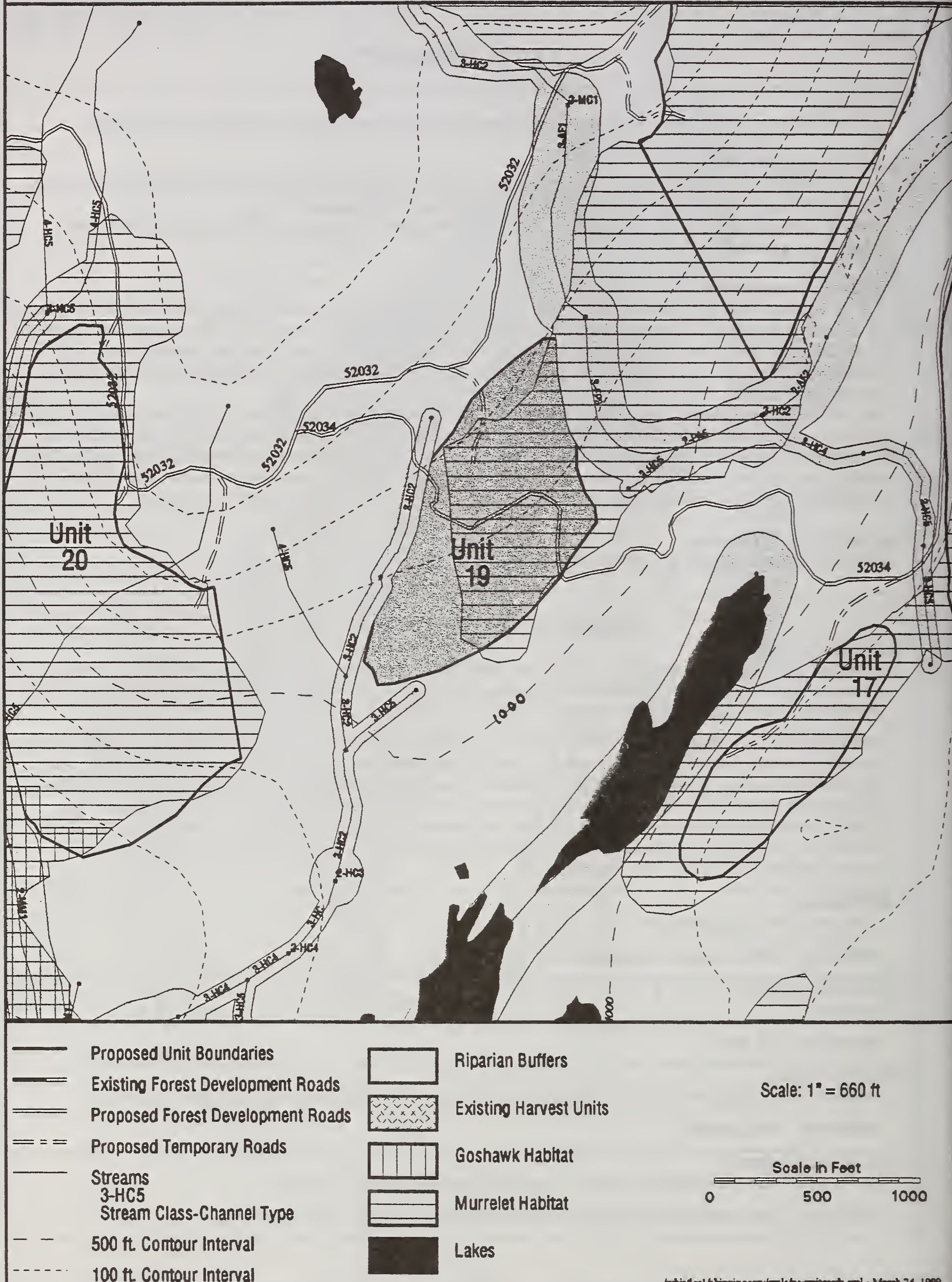
Visual/Recreation
Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway.

Mitigation: None needed.

Other Resources/Issues
Concern: Stand is in a wind-prone area. Blowdown along the edge is a concern.

Mitigation: Leave an irregular boundary on the east and north edge to create a feathered effect. O1

SKIPPING COW TIMBER HARVEST UNIT 19, ALTS: 2,3,4,5 - 25 ACRES



SKIPPING COW TIMBER SALE - UNIT CARD Unit 19 In Alternatives 2, 3, 4,5

Harvest Method: Alt. 2: running skyline, Alt. 3, 4, 5: highlead (uphill) cable
New road construction: Alt. 2, 3, 4, 5 Harvest Volume: Alt. 2: 396 MBF
Unit Size: 25 acres Alt. 3, 4, 5: 446 MBF

UNIT DEVELOPMENT

Stand Type:
Wind-prone area. Trees over 150 years old with pockets of younger aged trees and areas of stand initiation.

Stand Management Objectives:
Alt. 2: Future stand to have two or more canopy layers. Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.
Alt. 3,4,5: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Alt. 2: Remove 70 to 80 percent of the trees over 9 inches DBH. Trees less than 9 inches DBH and 20 to 30 percent of the trees over 9 inches DBH will be retained through the unit in clumps, small groups, and single trees. Their location will be determined by logging system capability. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.
Alt. 3,4,5: Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries
Concern: Middle Meter Bight Class III (HC2) tributary northeast of unit. Unit contains Class IV (HC0) headwaters of Vial Creek. Unit is in area mapped as windthrow-prone; there is concern for stream buffer stability.

Mitigation: Unit excludes sideslope of Class III stream. This buffer is perpendicular to dominant wind direction and ***requires additional field review*** for buffer stability (BMPs 12.6, 12.6a). Class IV stream location ***requires additional field review***. Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F14

Soils/Wetlands
Concern:

Mitigation:

Wildlife/TES Plants
Concern:

Mitigation: W1, W4

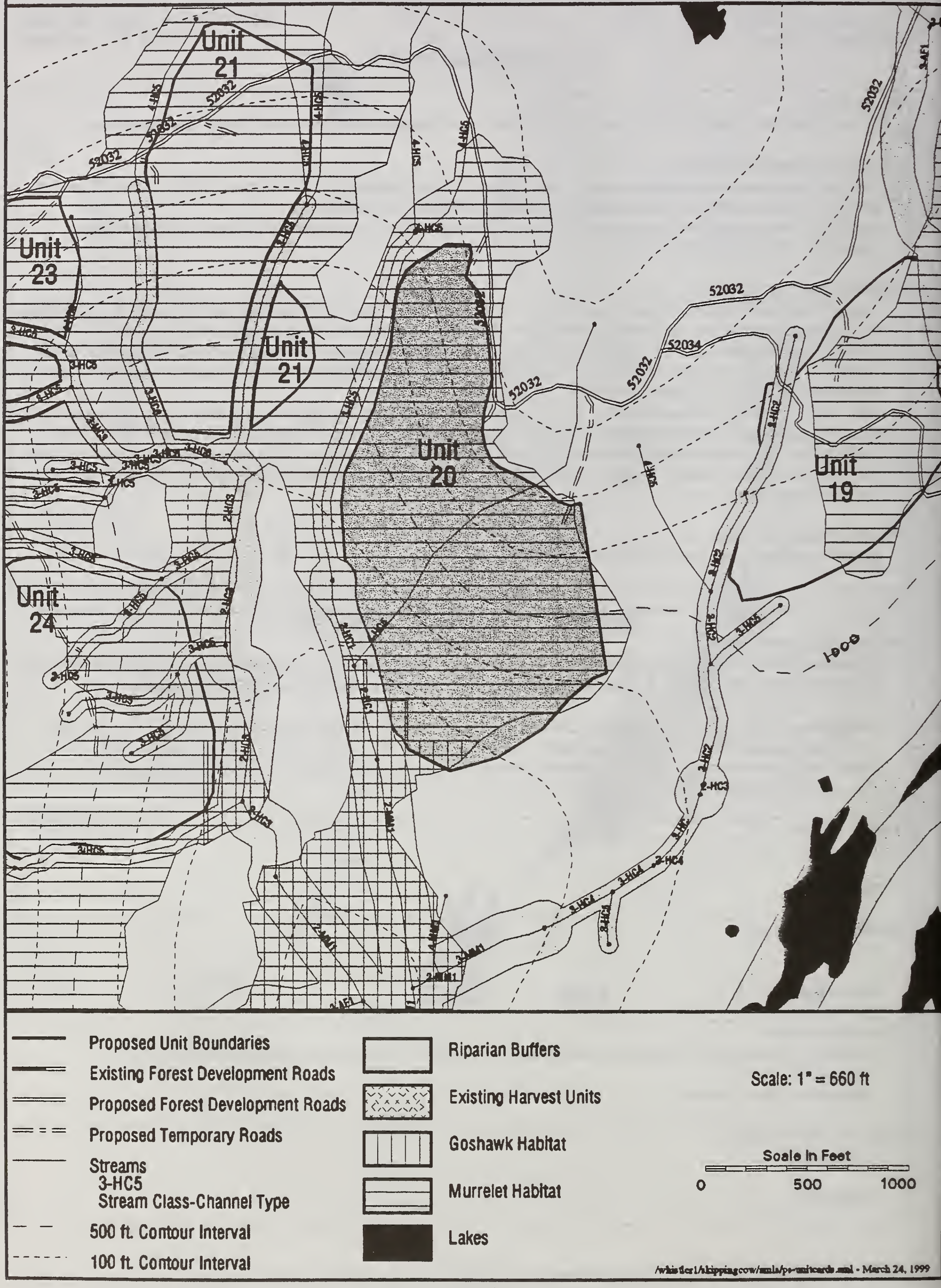
Visual/Recreation
Concern: Visual Quality Objective = Maximum Modification. Not seen from Alaska Marine Highway.

Mitigation: None needed.

Other Resources/Issues
Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 20, ALTS: 2,3,4,5 - 46 ACRES



Harvest Method: Alt. 2: running skyline, Alt. 3, 4, 5: highlead (uphill) cable
New road construction: Alt. 2, 3, 4, 5
Unit Size: 46 acres

Harvest Volume: Alt. 2: 875 MBF
Alt. 3, 4, 5: 983 MBF

UNIT DEVELOPMENT

Stand Type:
Wind-prone area. Trees over 150 years old with pockets of younger aged trees and areas of stand initiation.

Stand Management Objectives:
Alt. 2: Future stand to have two or more canopy layers. Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.
Alt. 3,4,5: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Alt. 2: Remove 70 to 80 percent of the trees over 9 inches DBH. Trees less than 9 inches DBH and 20 to 30 percent of the trees over 9 inches DBH will be retained through the unit in clumps, small groups, and single trees. Their location will be determined by logging system capability. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.
Alt. 3,4,5: Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines, except in Alt. 5, where they will be mostly in the lower third of the slope. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries
Concern: Unit contains five Class IV (HC0, HC5) tributaries to Vial Creek. Vial Creek Class II and III (HC1) west of unit. Unit is in area mapped as windthrow-prone; there is concern for stream buffer stability.

Mitigation: Unit provides wide buffer along Vial Creek to avoid blind leads. Buffer is parallel to dominant wind direction and is expected to be relatively windfirm (BMPs 12.6, 12.6a). Class IV stream location ***requires additional field review*** to ensure it is not Class III. Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F4, F14

Soils/Wetlands
Concern: Approximately 9 acres wetlands scattered through the unit, ranging from 1 to 6 acres.

Mitigation: Review during layout and remove areas with nonproductive soils from unit as required by Forest Plan standards and guidelines. O2

Wildlife/TES Plants
Concern: There are approximately 2 acres of high probability goshawk nesting habitat (see map).

Mitigation: Implement Forest-wide standards and guidelines if a goshawk nest is found. W1, W11

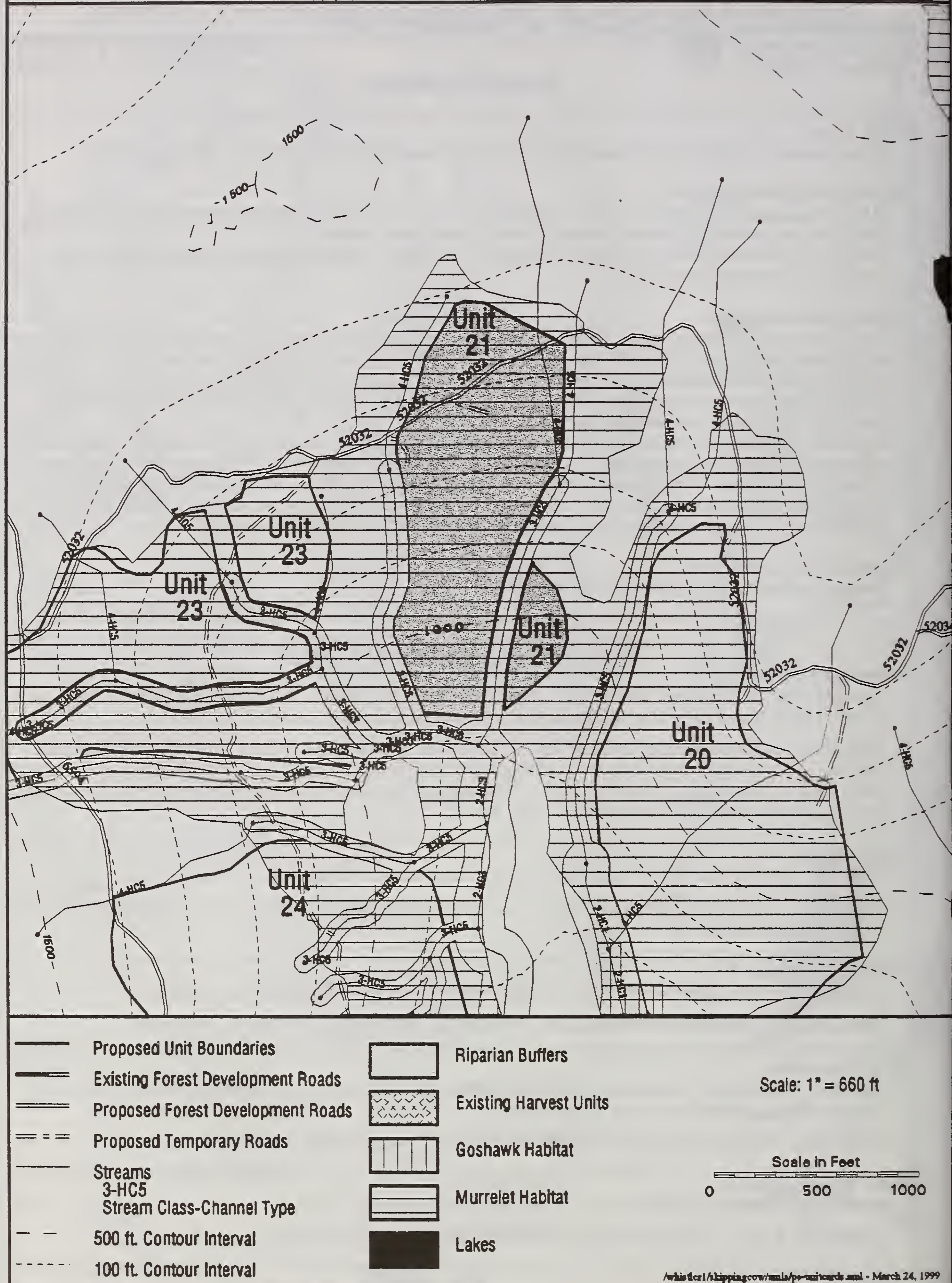
Visual/Recreation
Concern: Visual Quality Objective = Maximum Modification. With a clearcut prescription, upper portion of unit would be barely visible from Alaska Marine Highway.

Mitigation: Vary backline and edges of unit to give unit a more natural shape. V1, V4, V8

Other Resources/Issues
Concern: Stand is in a wind-prone area. Blowdown along the edge is a concern.

Mitigation: Leave an irregular boundary on the east and north edge to create a feathered effect. O1

SKIPPING COW TIMBER HARVEST UNIT 21, ALTS: 2,3,4,5 - 29 ACRES



SKIPPING COW TIMBER SALE - UNIT CARD Unit 21 In Alternatives 2, 3, 4, 5

Harvest Method: Alt. 2: slackline and running skyline, Alt. 3, 4, 5: highlead (downhill) and live skyline.
New road construction: Alt. 2, 3, 4, 5 Harvest Volume: Alt. 2: 551 MBF
Unit Size: 29 acres Alt. 3, 4, 5: 619 MBF

UNIT DEVELOPMENT

Stand Type:
Wind-prone area. Trees over 150 years old with pockets of younger aged trees and areas of stand initiation.

Stand Management Objectives:
Alt. 2: Future stand to have two or more canopy layers. Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.
Alt. 3,4,5: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Alt. 2: Remove 70 to 80 percent of the trees over 9 inches DBH. Trees less than 9 inches DBH and 20 to 30 percent of the trees over 9 inches DBH will be retained through the unit in clumps, small groups, and single trees. Their location will be determined by logging system capability. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.
Alt. 3,4,5: Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines, except in Alt. 5, where they will be mostly in the lower third of the slope. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce; would reduce mistletoe; and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries
Concern: Unit bounded by Class III (HC6) and Class II (HC5, HC6) tributaries to Vial Creek. Unit contains three Class IV (HC5, HC0) tributaries to Vial Creek. Upper portion of unit is in area mapped as windthrow-prone; lower portion receives topographical protection and reduces concern for stream buffer stability.

Mitigation: Unit excludes sideslopes of Class III streams and provides at least 100-foot no harvest buffer along Class II reaches. Buffer is parallel to predominant wind direction or protected by topography and undisturbed stand to the south and expected to be relatively windfirm (BMPs 12.6, 12.6a). Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F4, F14

Soils/Wetlands
Concern: A 3-acre and a 0.1-acre wetland are located along the east edge of the unit.

Mitigation: Review during layout and remove areas with nonproductive soils from unit as required by Forest Plan standards and guidelines. O2

Wildlife/TES Plants
Concern:

Mitigation: W1

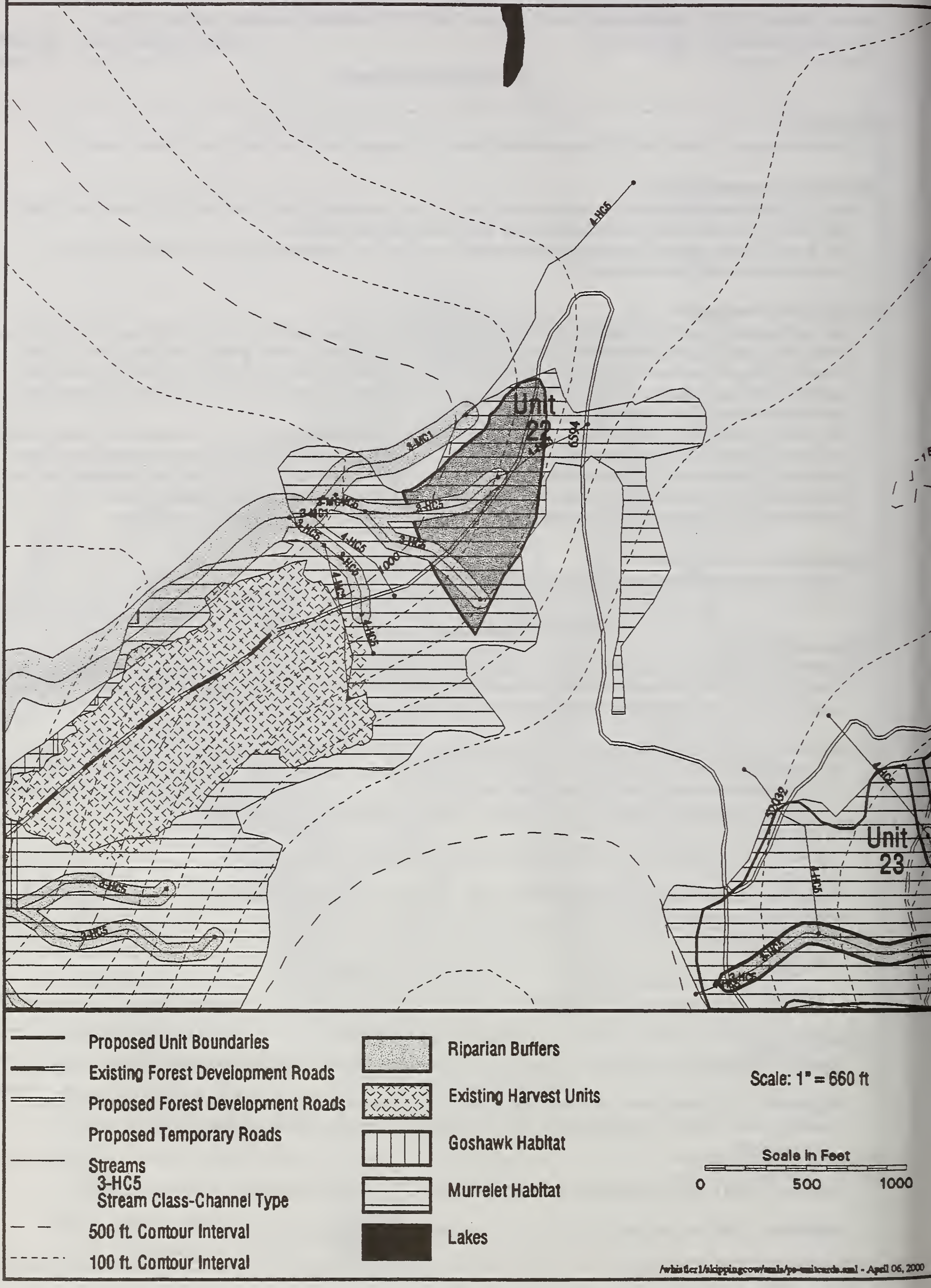
Visual/Recreation
Concern: Visual Quality Objective = Maximum Modification. Unit barely visible from Alaska Marine Highway.

Mitigation: Vary backline and edges of unit to give unit a more natural shape. Try to leave more trees on the downhill portion of the road to partially screen the unit from the Alaska Marine Highway. V1, V4, V8

Other Resources/Issues
Concern: Stand is in a wind-prone area. Blowdown along the edge is a concern.

Mitigation: Leave an irregular boundary on the east, west, and north edge to create a feathered effect. O1

SKIPPING COW TIMBER HARVEST UNIT 22, ALTS: 2,3,4,5 - 11 ACRES



Harvest Method: Alt. 2: running skyline, Alt. 3, 4, 5: highlead (both uphill and downhill)
New road construction: Alt. 2, 3, 4, 5 Harvest Volume: Alt. 2: 205 MBF
Unit Size: 11 acres Alt. 3, 4, 5: 230 MBF

UNIT DEVELOPMENT

Stand Type:
Gap-phase blowdown area. Trees over 150 years old with pockets of younger aged trees.

Stand Management Objectives:
Alt. 2: Future stand to have two or more canopy layers. Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.
Alt. 3,4,5: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Alt. 2: Remove 70 to 80 percent of the trees over 9 inches DBH. Trees less than 9 inches DBH and 20 to 30 percent of the trees over 9 inches DBH will be retained through the unit in clumps, small groups, and single trees. Their location will be determined by logging system capability. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.
Alt. 3,4,5: Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries
Concern: Unit contains Class III (HC5) and Class IV (HC0) headwaters of Snail Creek, tributary of Nesbitt Creek.

Mitigation: Unit excludes sideslopes of Class III streams (BMPs 12.6, 12.6a). Road location provides for full suspension by locating setting boundaries on stream courses. Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F4, F14, F17

Soils/Wetlands
Concern: MP 6.7 and MP 8.3. Full bench with endhaul road construction.

Mitigation: F17

Wildlife/TES Plants
Concern:

Mitigation: W1, W4

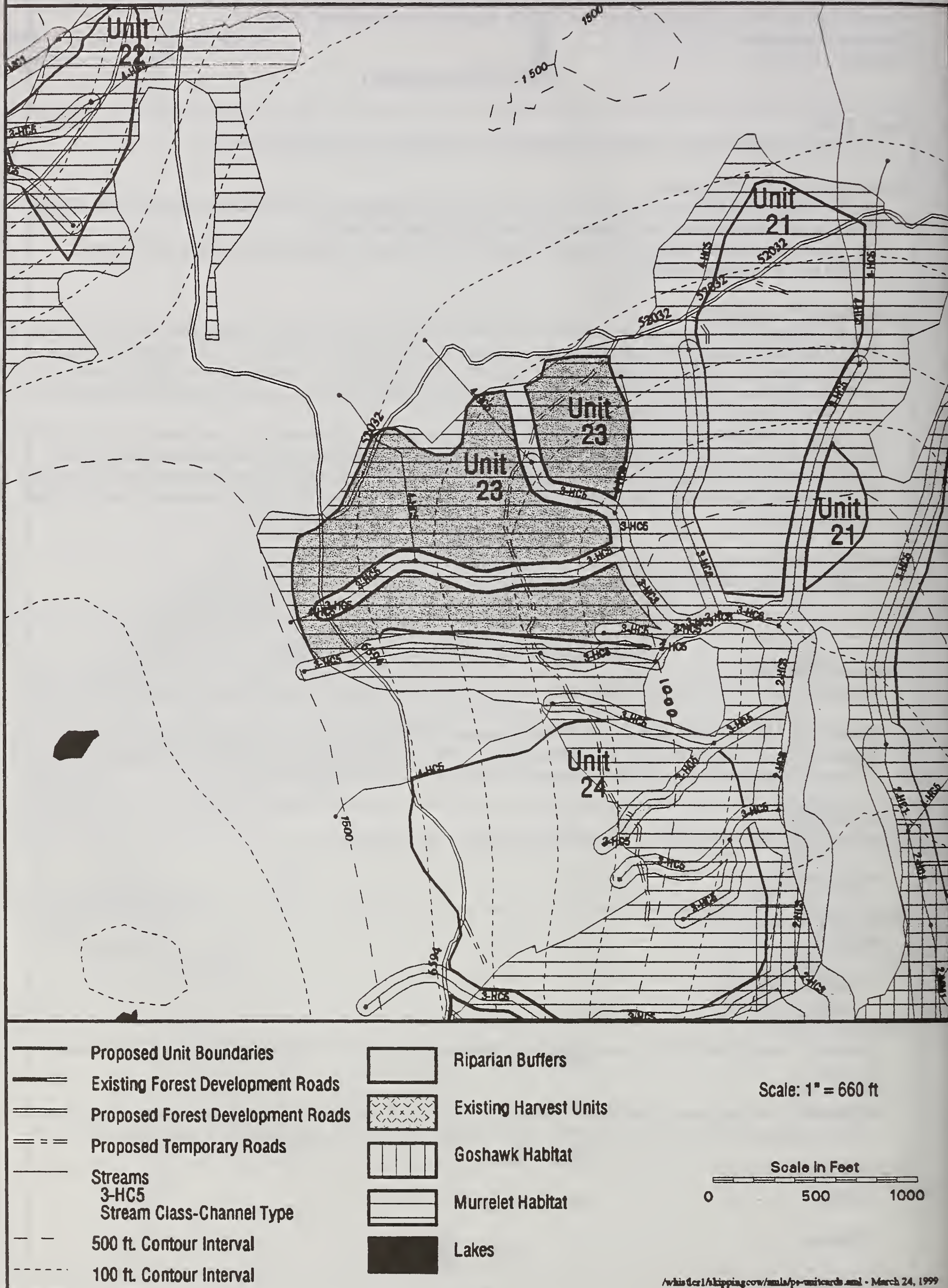
Visual/Recreation
Concern: Visual Quality Objectives = Maximum Modification. Upper 1/5 of unit visible from Alaska Marine Highway.

Mitigation: Vary edges and backlines of unit to give unit a more natural shape. Try to leave more reserve trees below road than in the rest of unit to soften views of the unit (and road) from the Alaska Marine Highway. V1, V8

Other Resources/Issues
Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 23, ALTS: 2,3,4,5 - 33 ACRES



Harvest Method: Alt. 2: running skyline, Alt. 3, 4, 5: highlead (both uphill and downhill)
New road construction: Alt. 2, 3, 4, 5 Harvest Volume: Alt. 2: 654 MBF
Unit Size: 33 acres Alt. 3, 4, 5: 736 MBF

UNIT DEVELOPMENT

Stand Type: Gap-phase blowdown area. Trees over 150 years old with pockets of younger aged trees.

Stand Management Objectives:

Alt. 2: Future stand to have two or more canopy layers. Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.

Alt. 3,4,5: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:

Alt. 2: Remove 70 to 80 percent of the trees over 9 inches DBH. Trees less than 9 inches DBH and 20 to 30 percent of the trees over 9 inches DBH will be retained through the unit in clumps, small groups, and single trees. Their location will be determined by logging system capability. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.

Alt. 3,4,5: Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:

Release, possible planting, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Unit is bounded by and contains Class III (HC5, HC6) and Class IV (HC5, HC0) tributaries to Vial Creek. Unit receives topographical protection from dominant wind direction. Most stream buffers consist of small, scrubby timber, not prone to windthrow.

Mitigation: Unit excludes sideslopes of Class III streams (BMPs 12.6, 12.6a). Road location provides for full suspension by locating setting boundaries on stream courses. Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F14

Soils/Wetlands

Concern: Three wetlands, ranging from 0.2 acre to 1 acre are in the unit.

Mitigation: None needed.

Wildlife/TES Plants

Concern:

Mitigation: W1, W4

Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. With a clearcut prescription, the uphill portion of unit would be visible from the Alaska Marine Highway.

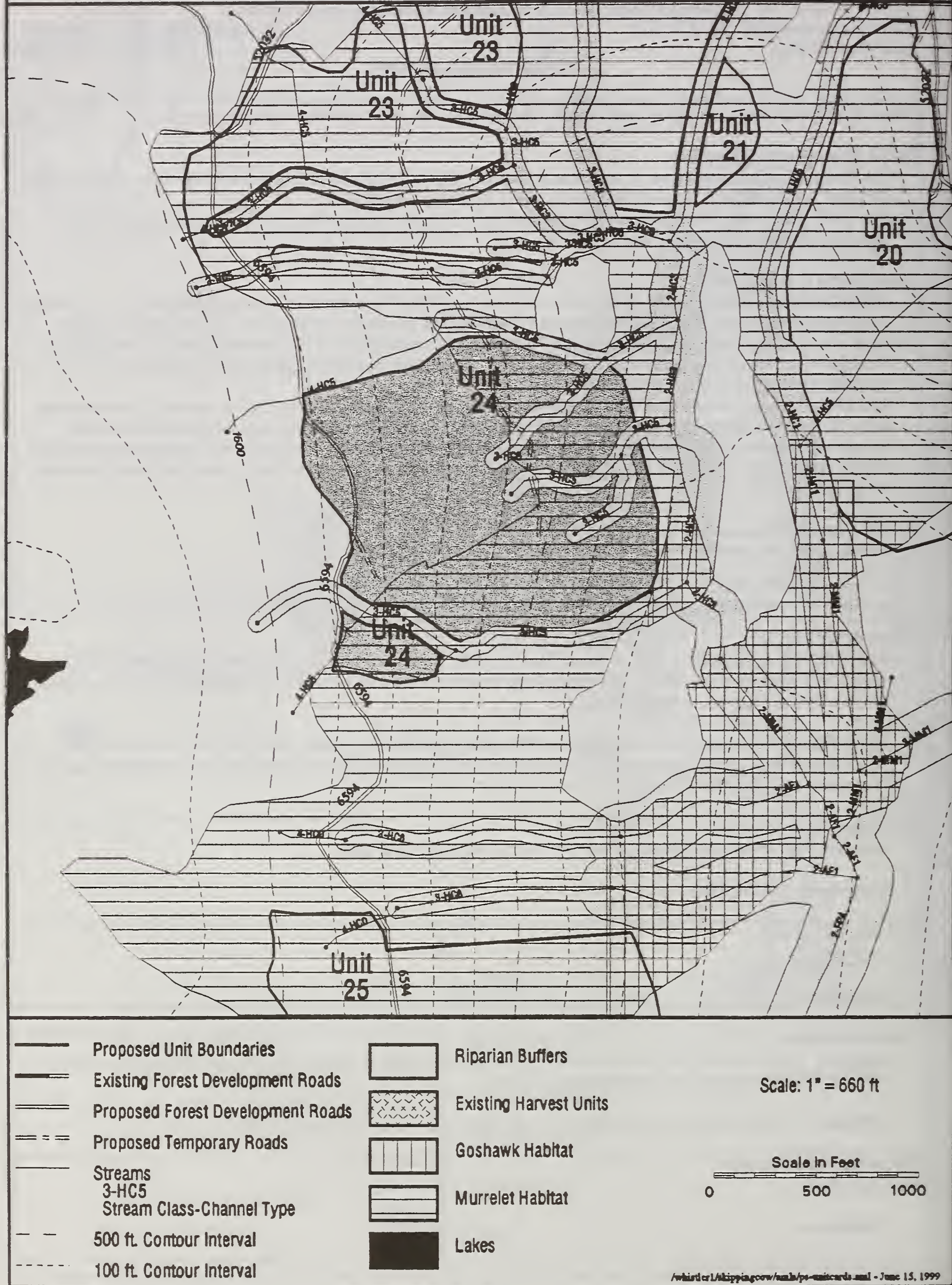
Mitigation: Vary backline and edges of unit to give unit a more natural shape. V1, V4, V8

Other Resources/Issues

Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 24, ALTS: 2,3,4,5 - 48 ACRES



SKIPPING COW TIMBER SALE - UNIT CARD Unit 24 In Alternatives 2, 3, 4, 5

Harvest Method: Alt. 2: running skyline, Alt. 3, 4, 5: highlead (uphill)
New road construction: Alt. 2, 3, 4, 5
Unit Size: 48 acres

Harvest Volume: Alt. 2: 704 MBF
Alt. 3, 4, 5: 792 MBF

UNIT DEVELOPMENT

Stand Type:
Gap-phase blowdown area. Trees over 150 years old with pockets of younger aged trees.

Stand Management Objectives:
Alt. 2: Future stand to have two or more canopy layers. Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.
Alt. 3,4,5: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Alt. 2: Remove 70 to 80 percent of the trees over 9 inches DBH. Trees less than 9 inches DBH and 20 to 30 percent of the trees over 9 inches DBH will be retained through the unit in clumps, small groups, and single trees. Their location will be determined by logging system capability. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.
Alt. 3,4,5: Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Release, possible planting, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries

Concern: Unit is bounded by and contains Class III (HC5) and Class IV (HC5, HC0) tributaries to Vial Creek. Unit receives topographical protection from dominant wind direction. Most stream buffers consist of small, scrubby timber, not prone to windthrow.

Mitigation: Unit excludes sideslopes of Class III streams (BMPs 12.6, 12.6a). Road location provides for full suspension by locating setting boundaries on stream courses. North Class III stream ***requires additional field review*** to evaluate need for buffer (it may be Class IV). Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F4, F14

Soils/Wetlands

Concern: 4 acres of wetlands in the middle of the unit (one 0.4 acre and one 3.4 acres).

Mitigation: Review during layout and remove areas with nonproductive soils from unit as required by Forest Plan standards and guidelines.

Wildlife/TES Plants

Concern:

Mitigation: W1, W4, W8, W21, W22

Visual/Recreation

Concern: Visual Quality Objective = Maximum Modification. With a clearcut prescription, the uphill portion of unit would be visible from the Alaska Marine Highway.

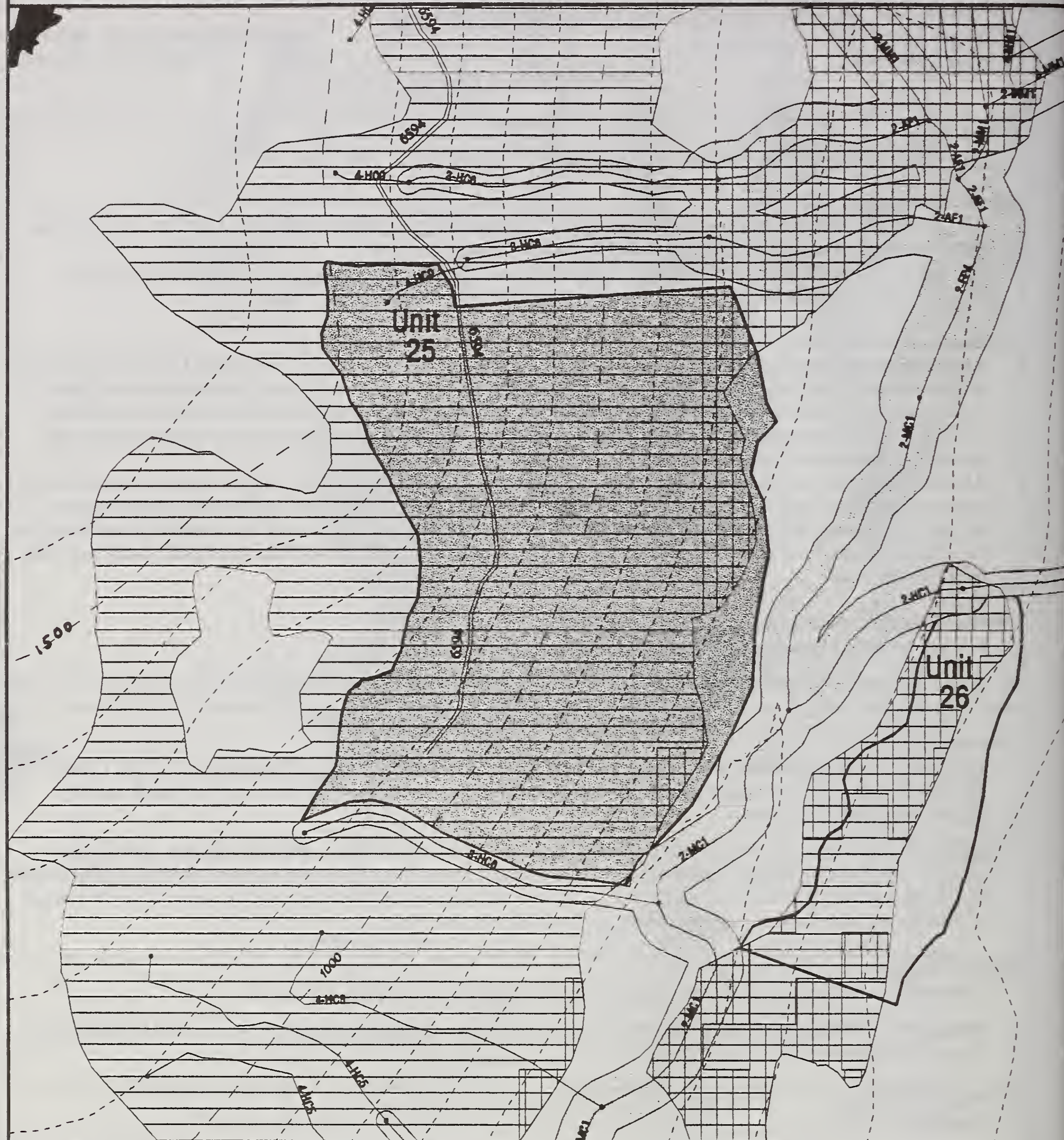
Mitigation: Vary backline and edges of unit to give unit a more natural shape. V1, V4, V8

Other Resources/Issues

Concern:

Mitigation:

SKIPPING COW TIMBER HARVEST UNIT 25, ALTS: 2,3,4,5 - 92 ACRES



Proposed Unit Boundaries	Riparian Buffers
Existing Forest Development Roads	Existing Harvest Units
Proposed Forest Development Roads	Goshawk Habitat
Proposed Temporary Roads	Murrelet Habitat
Streams 3-HC5 Stream Class-Channel Type	Lakes
500 ft. Contour Interval	
100 ft. Contour Interval	

Scale: 1" = 660 ft

Scale in Feet

0 500 1000

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Harvest Method: Cable
New road construction: Alt. 2, 3, 4, 5
Unit Size: 92 acres

Harvest Volume: Alt. 2: 1,608 MBF
Alt. 3, 4, 5: 1,809 MBF

UNIT DEVELOPMENT

Stand Type:
Wind-prone area. Trees over 150 years old with pockets of younger aged trees and areas of stand initiation.

Stand Management Objectives:
Alt. 2: Future stand to have two or more canopy layers. Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.
Alt. 3,4,5: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Alt. 2: Remove 70 to 80 percent of the trees over 9 inches DBH. Trees less than 9 inches DBH and 20 to 30 percent of the trees over 9 inches DBH will be retained through the unit in clumps, small groups, and single trees. Their location will be determined by logging system capability. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.
Alt. 3,4,5: Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines, except in Alt. 5, where they will be mostly in the lower third of the slope. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries
Concern: Unit is adjacent to Vial Creek Class II (MC1) and contains Class IV (HC5, HC0) tributaries to Vial Creek. A Class III (HC5) tributary to Vial Creek bounds the south end of the unit. Unit is in area mapped as windthrow-prone; there is concern for stream buffer stability.

Mitigation: Unit provides at least 100-foot no harvest buffer along Class III stream. This buffer is parallel to predominant wind direction and timber is mostly scrub, expected to be windfirm. Unit excludes sideslopes of Class III stream. This buffer is protected by undisturbed stand to the south (BMPs 12.6, 12.6a). Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1, F4, F14, F15, F17, F18

Soils/Wetlands
Concern: There is a 0.4-acre wetland in the southern portion of the unit. Recent landslide in upper portion of unit (above road).

Mitigation: Provide partial or full suspension across unstable area.

Wildlife/TES Plants
Concern: There are approximately 6 acres of potential goshawk nesting habitat (see map).

Mitigation: Implement Forest-wide standards and guidelines if a goshawk nest is found. W1, W4, W8, W11, W21, W22

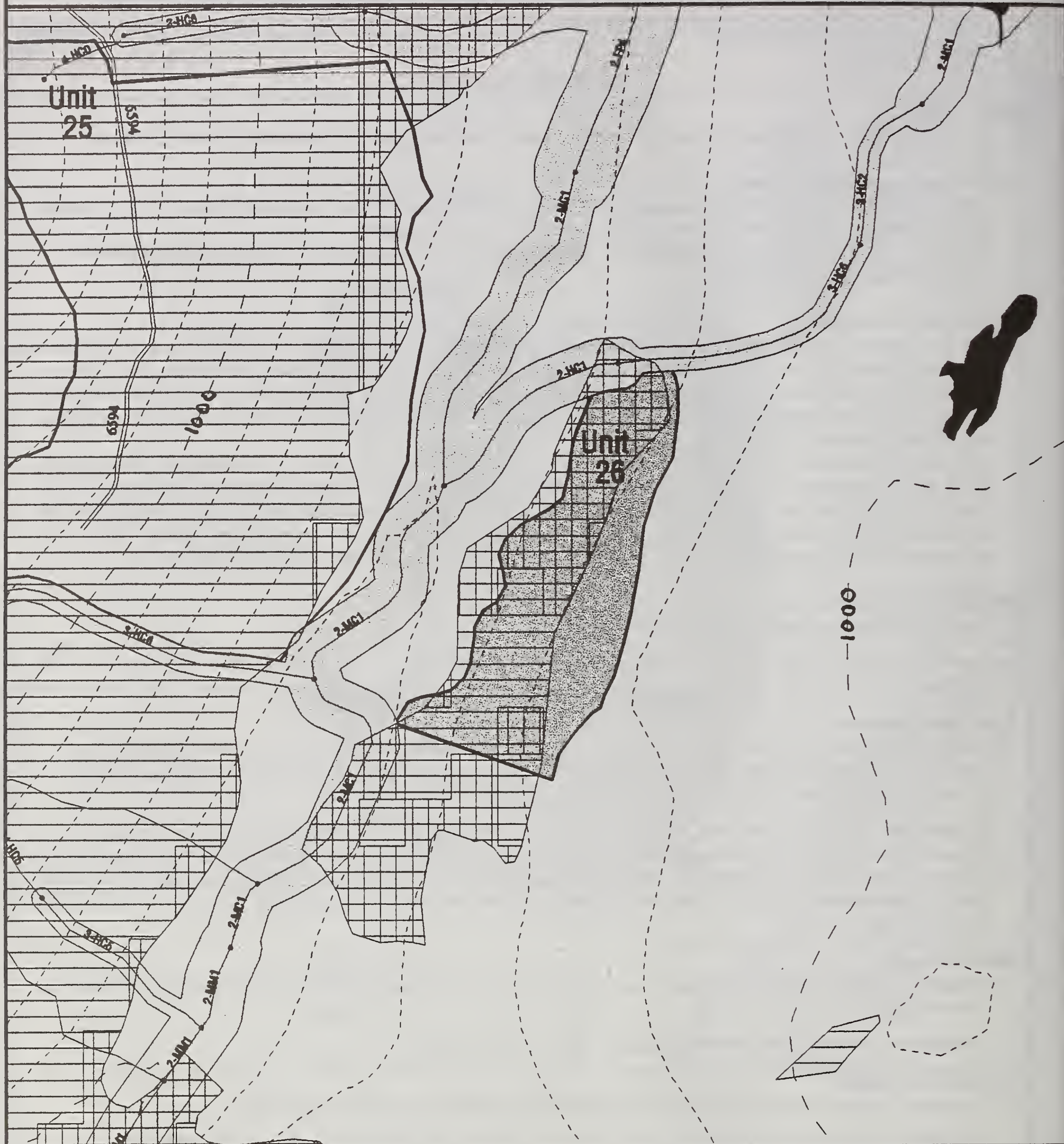
Visual/Recreation
Concern: Visual Quality Objectives = Maximum Modification. Most of unit visible from Alaska Marine Highway.

Mitigation: For all alternatives, vary edges and backlines of unit to give unit a more natural shape. Try to leave more reserve trees in eastern and southern portions of unit than in the rest of unit to soften views of the unit from the Alaska Marine Highway. V1, V4, V8

Other Resources/Issues
Concern: Stand is in a wind-prone area. Blowdown along the edge is a concern.

Mitigation: Leave an irregular boundary on the east and north edge to create a feathered effect. O1

SKIPPING COW TIMBER HARVEST UNIT 26, ALTS: 2,3,5 - 21 ACRES



- Proposed Unit Boundaries
- Existing Forest Development Roads
- Proposed Forest Development Roads
- Proposed Temporary Roads
- Streams
  3-HC5
  Stream Class-Channel Type
- 500 ft. Contour Interval
- 100 ft. Contour Interval

- Riparian Buffers
- Existing Harvest Units
- Goshawk Habitat
- Murrelet Habitat
- Lakes

Scale: 1" = 660 ft

Scale in Feet
0 500 1000

/whistler1/skippingcow/amls/pe-unitcards.aml - March 24, 1999

Harvest Method: cable yard (slackline) across Vial Cr.
No new road construction
Unit Size: 21 acres

Harvest Volume: Alt. 2: 334 MBF
Alt. 3, 5: 375 MBF

UNIT DEVELOPMENT

Stand Type:
Wind-prone area. Trees over 150 years old with pockets of younger aged trees and areas of stand initiation.

Stand Management Objectives:
Alt. 2: Future stand to have two or more canopy layers. Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.
Alt. 3, 5: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.

Silvicultural Prescription:
Alt. 2: Remove 70 to 80 percent of the trees over 9 inches DBH. Trees less than 9 inches DBH and 20 to 30 percent of the trees over 9 inches DBH will be retained through the unit in clumps, small groups, and single trees. Their location will be determined by logging system capability. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.
Alt. 3,5: Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries
Concern: Unit is adjacent to Vial Creek Class II (MC1, HC1). Class III (HC6) Vial Creek tributary bounds unit at north. One Class IV (HC0) tributary within unit. Unit is in area mapped as windthrow-prone; there is concern for stream buffer stability. Logging plan calls for yarding across Vial Creek to end of Road 6594 in Unit 25.

Mitigation: Unit provides at least 100-foot no harvest buffer along Class II stream. This buffer is parallel to predominant wind direction and timber is mostly scrub, expected to be windfirm. Profiles indicate full suspension is possible across Vial Creek. ***Consult fisheries specialist*** during designation of yarding corridors and development of streamcourse protection plan. Unit excludes sideslopes of Class III stream. This buffer is includes additional tree length for windfirmness (BMPs 12.6, 12.6a). Provide full suspension wherever possible across Class IV streams, at least partial suspension is required (BMPs 13.9, 13.16). F1

Soils/Wetlands
Concern: Cable yarding across Vial Creek may damage soils. Kushnehin soils in Vial Creek buffer. Approximately 1 acre of wetland (0.2 acres on the east edge of the unit and 0.8 on the west edge).

Mitigation: Maintain full suspension across Vial Creek. No harvest on Kushnehin soils. F4

Wildlife/TES Plants
Concern: There are approximately 7 acres of high probability goshawk nesting habitat (see map).

Mitigation: Implement Forest-wide standards and guidelines if a goshawk nest is found. W1, W4, W11

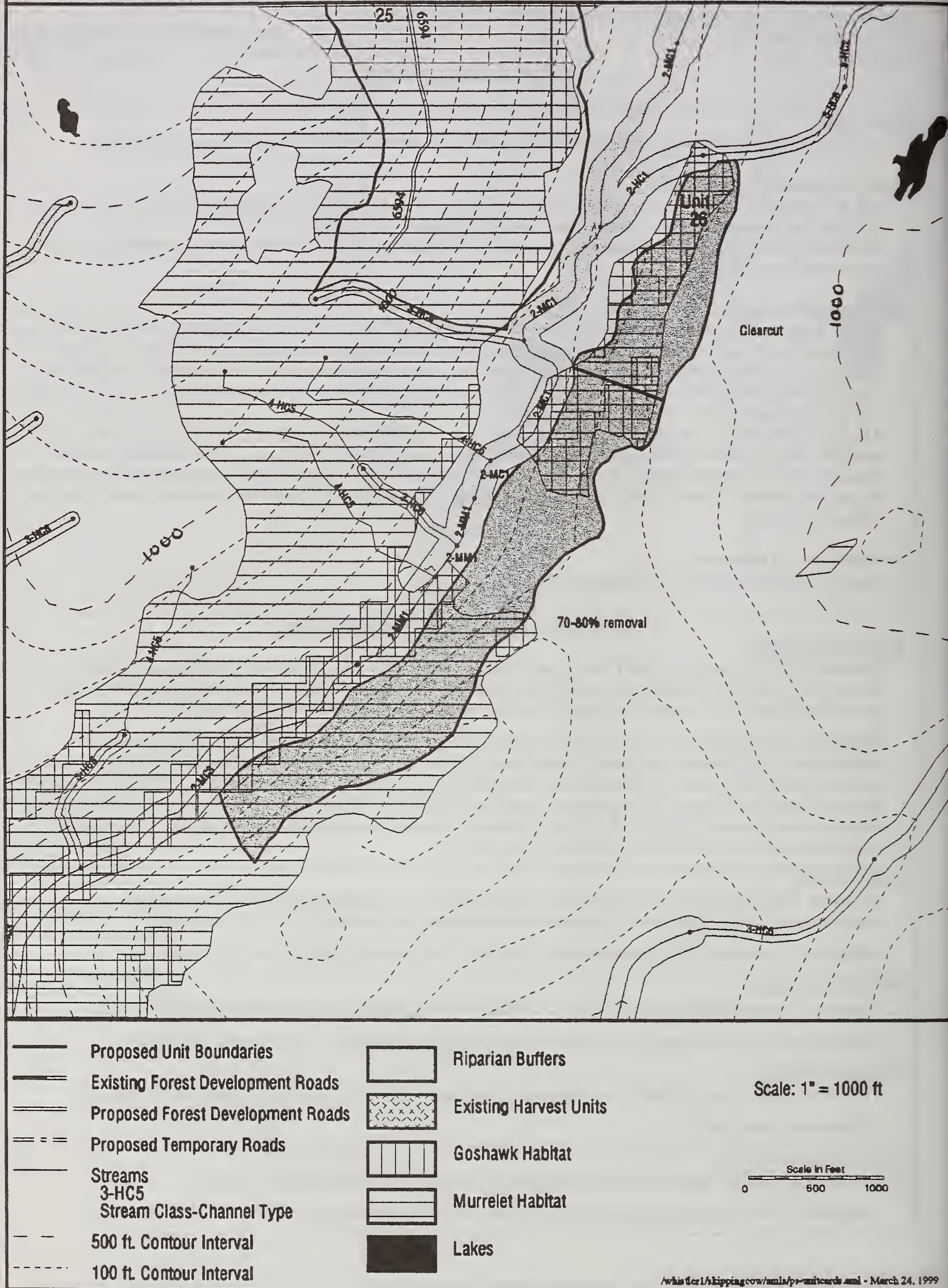
Visual/Recreation
Concern: Visual Quality Objective = Maximum Modification. Unit not seen from Alaska Marine Highway.

Mitigation: None needed.

Other Resources/Issues
Concern: Concern: Stand is in a wind-prone area. Blowdown along the edge is a concern.

Mitigation: Leave an irregular boundary on the east, west, and north edge to create a feathered effect. O1

SKIPPING COW TIMBER HARVEST UNIT 26, ALT: 4 - 81 ACRES



Harvest Method: helicopter
No new road construction
Unit Size: 81 acres

Harvest Volume: 1,468 MBF

UNIT DEVELOPMENT

Stand Type:
Wind-prone area. Trees over 150 years old with pockets of younger aged trees and areas of stand initiation.

Stand Management Objectives:
Northern 21 acres: Future stand will be primarily even-aged but will retain a component of the overstory into the next rotation to meet wildlife objectives.
Southern 60 acres: Future stand to have two or more canopy layers. Approximately 20 to 30 percent of the trees over 9 inches DBH are being retained to provide structure for wildlife through the rotation.

Silvicultural Prescription:
Northern 21 acres: Clearcut with reserve trees. Reserve trees will be unevenly distributed, e.g., in clumps or groups mostly along the unit boundaries and backlines. Clearcutting with reserves is proposed because this prescription would optimize the regeneration potential for fiber production, especially for spruce, would reduce mistletoe, and would be the most economical method. This prescription is also appropriate to meet the wildlife, watershed, visual, and other resource objectives.
Southern 60 acres: Remove 70 to 80 percent of the trees over 9 inches. Trees less than 9 inches DBH and 20 to 30 percent of the trees over 9 inches DBH will be retained through the unit in clumps, small groups, and single trees. Their location will be determined by logging system capability. This prescription would address wildlife concerns but it would provide less suitable conditions for regenerating spruce than clearcutting with reserves and would be a less cost-effective method of harvesting trees.

Possible Future Treatments:
Possible planting, release, pre-commercial thinning.

RESOURCE CONCERNS & MITIGATION

Watershed/Fisheries
Concern: A Class III (HC6) stream defines the northern boundary of the unit and transitions to a Class II (HC1) stream downslope of the unit. Verify buffer width to the Class II stream during layout. Full suspension cable yarding may occur across a Class II stream west of the unit.

Mitigation: No timber harvest within notch of the Class III stream. Otherwise, helicopter yarding is acceptable for this unit. A fisheries specialist will verify the buffer along the Class II stream. Provide a reasonable assurance of a windfirm buffer. F1

Soils/Wetlands
Concern: A 4.4-acre wetland in the east portion of the unit. Kushnehin soils in Vial Creek buffer.

Mitigation: Review during layout and remove areas with nonproductive soils from unit as required by Forest Plan standards and guidelines. No harvest on Kushnehin soils. F4

Wildlife/TES Plants
Concern: There are approximately 16 acres of high probability goshawk nesting habitat (see map).

Mitigation: Implement Forest-wide standards and guidelines if a goshawk nest is found. W1, W4, W11

Visual/Recreation
Concern: Visual Quality Objective = Maximum Modification. Unit not seen from Alaska Marine Highway.

Mitigation: None needed.

Other Resources/Issues
Concern: Stand is in a wind-prone area. Blowdown along the edge is a concern.

Mitigation: Leave an irregular boundary on the east, west, and north edge to create a feathered effect.

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Appendix C

Road Cards

Road Management Objectives from Glossary of Terms

Route Number: Normally only long-term Forest Development Roads are assigned road numbers.

Road Name: All long-term roads assigned numbers are given names.

Status: Current condition of the road; whether it is an existing, closed, or an opportunity for development.

Functional Class: The way in which a road services land and resource management needs and the character of service it provides. Functional classifications for roads are: forest arterial, forest collector, and forest local.

Service Life: The length of time that a facility is expected to provide a specified service.

Short Term—A facility developed and operated for a limited period of time that will cease to exist as a transportation facility after the purpose for which it was constructed is completed, and the occupied land is reclaimed and managed for natural resource purposes.

Long Term—Long-term roads are developed and operated for long-term land management and resource utilization needs.

Surface: The top layer of pavement structure, sometimes called the "wearing course," usually designed to resist skidding, traffic abrasion, and the disintegrating effects of climate. Aggregate surfacing or in-place processing of road surface (IMP).

Width: The width in feet of an unsurfaced road surface as measured from shoulder to shoulder.

Design Speed: The speed determined for design and correlation of the physical features of a road or road segment that influence vehicle operation. It is the maximum safe speed that the design vehicle can maintain over a specified segment of a road when conditions are so favorable that the design features of the road, rather than operational limitations of the vehicle, govern. The design speed is the safe speed for the design situation only.

Critical Vehicle: The vehicle, normally the largest (by weight, size, or unique configuration), whose limited use on the road is necessary to complete the planned activity.

Design Vehicle: The vehicle frequently using the road that determines the minimum standard for a particular design element.

Highway Safety Act: Whether or not the road is subject to the Highway Safety Act (HSA). Roads where the HSA applies are usually classified as Maintenance Level 3, 4, or 5. Maintenance Level 1 and 2 roads are not maintained for travel by standard passenger cars.

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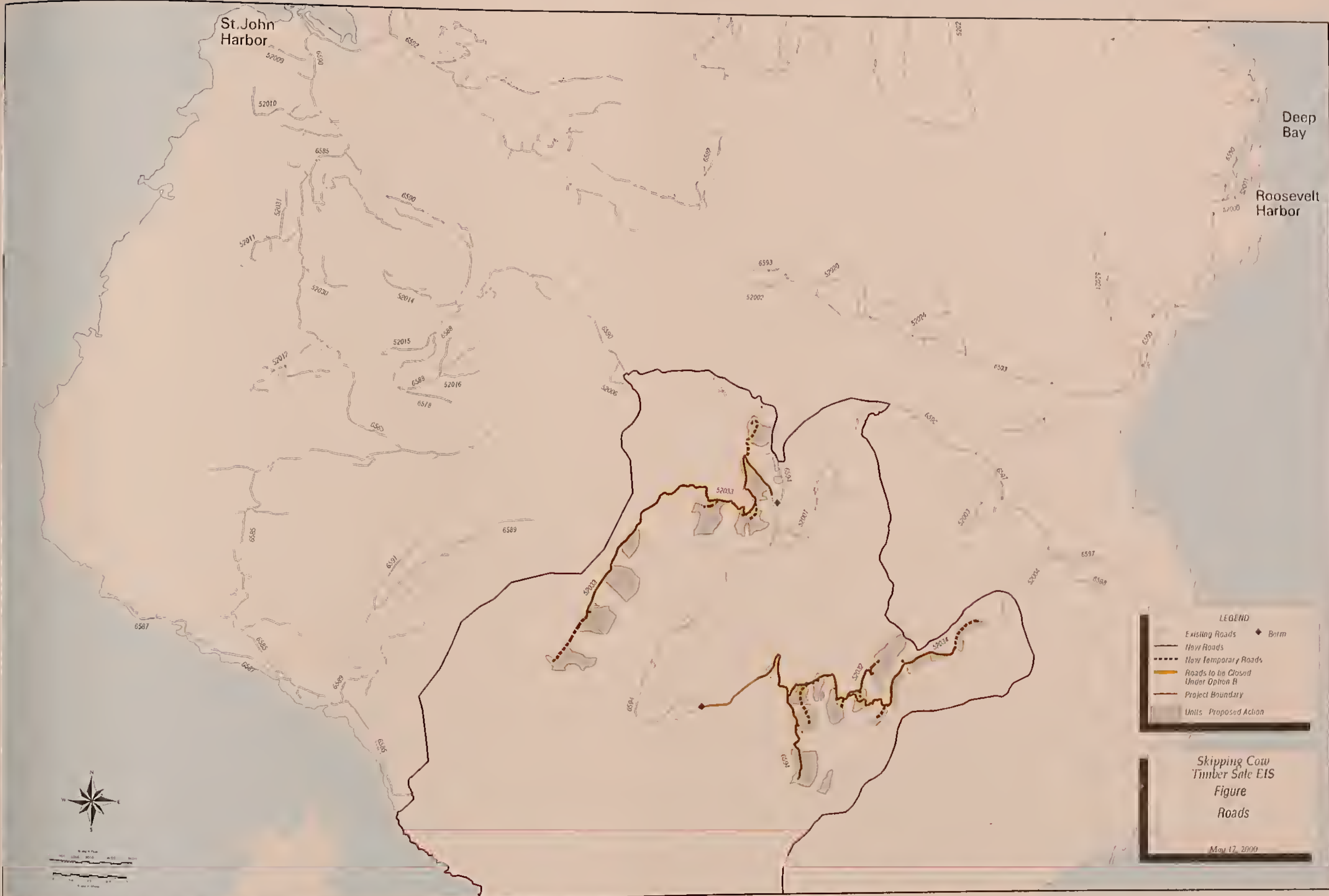

May 17, 2000 roads.ps

Road Management Objectives

Project			System	Land Use Designation
Skipping Cow			Zarembo	TM, SV
Route No	**Route Name**		**Begin Terminus**	**End Terminus**
6590	St John		St John LTF	Loops back to MP 0.96
Begin MP	**Length**	**Status**	**Map Quarter Quad**	**Photo year, roll, photos**
0.00	42.40	Existing	Petersburg A-3 NW, NE	

General Design Criteria and Elements

Functional Class	Service Life	Surface	Width	Design Speed	Critical Vehicle	Design Vehicle
Collector	LC	Shot rock	14'	20	Low-Boy	Logging Truck

Intended Purpose/Future Use
Mainline collector road on Zarembo Island. Provides access for all activities on the island.

Maintenance Criteria

Bmp	Emp	Operational Maintenance Level (Current Condition)	Objective Maintenance Level (Desired Future Condition)	Alaska Forest Practices Act Class
0.00	42.40	3	3	Active

Maintenance Narrative
AFR&P Reg's. "active" status: Keep culverts, catchbasins, ditches and ditch blocks functional. Grade as needed to maintain crown and running surface. Control roadside brush to maintain sight distances. Roadway from Rd. 52000 jct. to Rd. 6594 will be reconditioned (including culvert replacement where needed) and resurfaced prior to log haul.

Operation Criteria

Highway Safety Act: Yes **Jurisdiction:** National Forest ownership

Traffic Management Strategies		
	Encourage:	N/A
	Accept:	All vehicle and traffic types in accordance with Road Order No. R-10--01 (prohibits commercial hauling w/o permit, carelessness, exceeding load limits)
	Discourage:	N/A
	Prohibit:	N/A
	Eliminate:	N/A

Travel Management Narrative
Public travel on this isolated system is very low except during deer hunting season. Necessity of barging private vehicles makes this road system unattractive to other general public. During hunting season public traffic may conflict with commercial use, therefore warning signs will be posted.

Approved______________________________ __________________
District Ranger Date

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Road Management Objectives

Project			System	Land Use Designation
Skipping Cow			Zarembo	TM
Route No	**Route Name**		**Begin Terminus**	**End Terminus**
6594	Mustang Lake		MP 31.04 of Rd 6590	Last Snail Creek landing
Begin MP	**Length**	**Status**	**Map Quarter Quad**	**Photo year, roll, photos**
0.00	6.36	Existing	Petersburg A-3 SW	

General Design Criteria and Elements

Functional Class	Service Life	Surface	Width	Design Speed	Critical Vehicle	Design Vehicle
Local	LI	Shot rock	14'	10	Lowboy Truck	Logging Truck

Intended Purpose/Future Use
Access for recurring silvicultural activities. Will be extended in the future to access timber past Kettle Creek.

Maintenance Criteria

Bmp	Emp	Operational Maintenance Level (Current Condition)	Objective Maintenance Level (Desired Future Condition)	Alaska Forest Practices Act Class
0.00	5.45	3	3	Active
5.45	6.36	1		Inactive
		(planned condition)		
5.45	6.36	2		Active
5.45	6.36		1	Inactive

Maintenance Narrative
AFR&P Reg's "active" status: MP 0.00-5.45, Replace log structures on entire length with permanent structures. Keep drainage functional. Control roadside brush. Keep surface crowned.

AFR&P Reg's "inactive" status: Stormproof MP 5.45-6.36 by providing drivable waterbars/rolling dips.

Operation Criteria

Highway Safety Act: Yes (0-5.45) No (5.45-6.36) **Jurisdiction:** National Forest ownership

Traffic Management Strategies		
	Encourage:	N/A
	Accept:	All vehicle and traffic types in accordance with Road Order No. R-10-96-01 (prohibits commercial hauling w/o permit, carelessness, exceeding load limits) to Snail Creek bridge (MP 5.45) except ATV's (MP 5.45 – MP 6.36) after timber harvest.
	Discourage:	N/A
	Prohibit:	Public traffic during timber harvest by road closure order, all motorized vehicles by road closure order after timber harvest.
	Eliminate:	Passenger and high clearance vehicles after timber harvest.

Travel Management Narrative
A berm will be installed near the Snail Creek bridge. This is expected to be an effective barrier to passenger and high clearance vehicle use.

Approved______________________________ ____________________
District Ranger Date

Road Management Objectives

Site Specific Design Criteria
Road 6594

ROAD LOCATION: All stream crossing structure replacement will be done along the existing roadway, no relocation is planned.

EROSION CONTROL: An erosion control plan will be developed by the contractor and approved by the Contracting Officer (BMP 14.5). All areas of organic or mineral soil exposed during construction shall be grass seeded and fertilized (BMP 12.17,14.8).

ROCK PITS: The existing pit at MP 4.94 will be expanded to provide rock for initial construction of the proposed extension of Rd. 6594.

STREAM CROSSINGS:

A) **MP** 0.914 | **AHMU Class** 2 | **Channel Type** MM1 | **Incision** 3-5 ft
Max. Width 5 ft | **Max. Depth** 2 ft | **Gradient** 3% | **Substrate** large cobbles
Structure 60'x46" CMPA | **Passage** Yes | **Timing dates** None
Narrative: Outlet of Mustang Lake, 3-5 ft high muskeg banks.

B) **MP** 2.053 | **AHMU Class** 2 | **Channel Type** MC1 | **Incision** 5 ft
Max. Width 8 ft | **Max. Depth** 1 ft | **Gradient** 6% | **Substrate** bedrock
Structure 60' CMP w/baffles | **Passage** Yes | **Timing dates** none
Narrative: Replace perched 48' cmp to provide resident fish passage. New pipe needs removable baffles for cleanout.

C) **MP** 2.119 | **AHMU Class** 3 | **Channel Type** MC2 | **Incision** 20 ft
Max. Width 25 ft | **Max. Depth** 4 ft | **Gradient** 15% down, 3% up | **Substrate** bedrock
Structure 70 ft modular bridge | **Passage** No | **Timing dates** none
Narrative: Far approach may require wire wall.

D) **MP** 2.798 | **AHMU Class** 3 | **Channel Type** HC2 | **Incision** 6 ft
Max. Width 8 ft | **Max. Depth** 2 ft | **Gradient** 6% down, 20% up | **Substrate** angular cobbles, boulders
Structure 72 inch CMP | **Passage** No | **Timing dates** none
Narrative: Debris jam upstream, place riprap to hold dam in place.

E) **MP** 2.936 | **AHMU Class** 3 | **Channel Type** HC2 | **Incision** 10 ft
Max. Width 10 ft | **Max. Depth** 2 ft | **Gradient** 18% | **Substrate** bedrock
Structure 48" cmp left, 60" cmp right | **Passage** No | **Timing dates** none
Narrative: 5 ft bedrock falls below existing bridge, ~20 ft drop from edge of road. Confluence of two channels above bridge, left: 4'x1.5' @10%; right:5-6'x2' @ 15%. Not enough room for one pipe to pick up both flows. Propose installing two pipes at this location, with outlets into single existing bedrock channel.

F) **MP** 3.800 | **AHMU Class** 2 | **Channel Type** HC2 | **Incision** 12 ft
Max. Width 6-8 ft | **Max. Depth** 2 ft | **Gradient** 10% | **Substrate** angular cobbles
Structure see Narrative | **Passage** Yes | **Timing dates** none
Narrative: Install bridge or structure capable of passing fish. Structure required may be an oversized corrugated metal pipe arch, corrugated metal pipe arch with baffles, bottomless arch pipe, or a bridge.

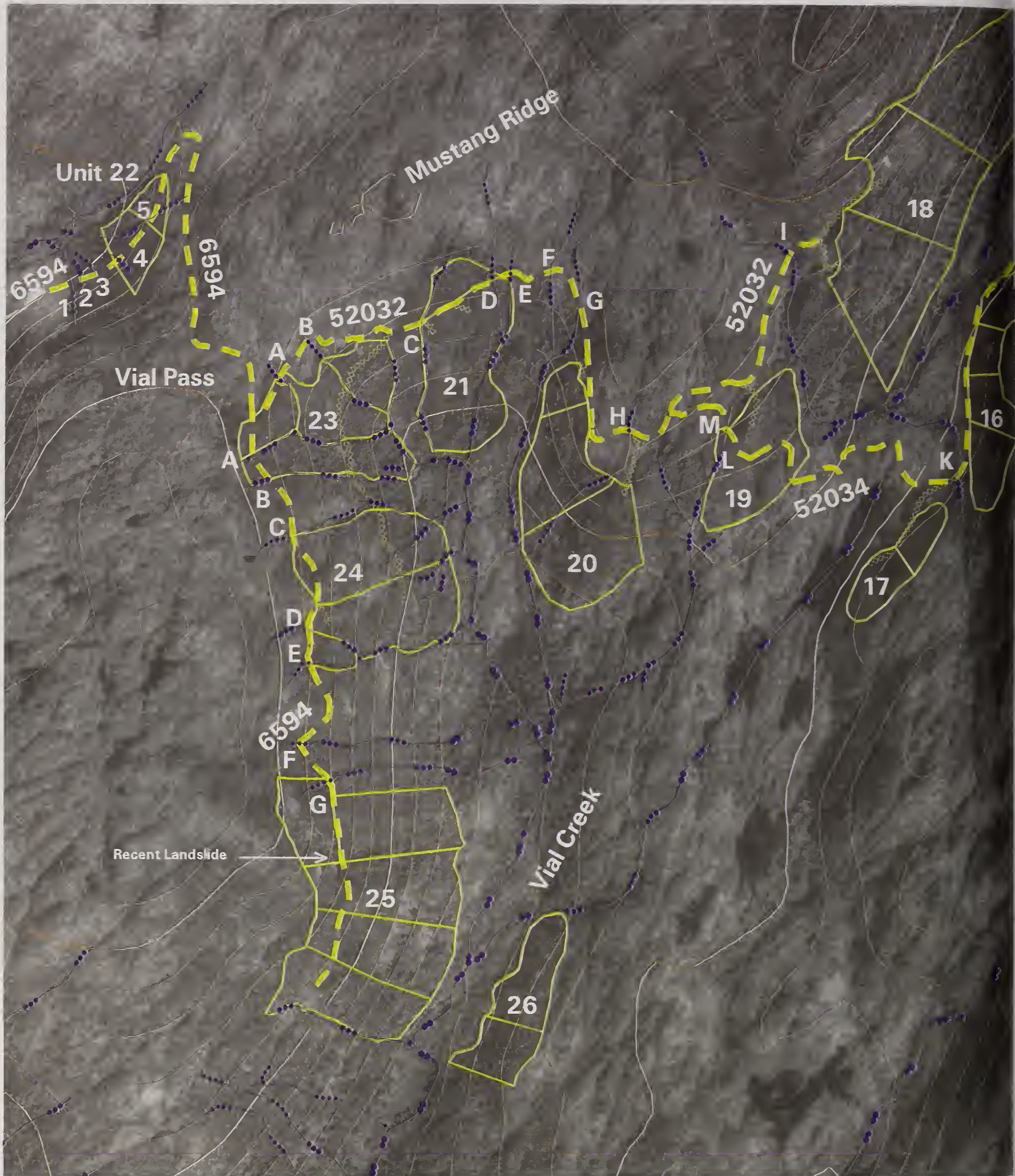
G) **MP** 5.069 **AHMU Class** 2 **Channel Type** MM1 **Incision** 3 ft
Max. Width 4 ft **Max. Depth** 2 ft **Gradient** 3% down, 6% up **Substrate** coarse gravel
Structure 60"x46" cmpa buried w/baffles **Passage** Yes **Timing dates** none
Narrative: Current 36 inch cmp has 5 inch perch from outlet scour, 3% grade. Bury pipe with baffles for retention of substrate to provide resident fish passage.

H) **MP** 5.281 **AHMU Class** 2 **Channel Type** MM1 **Incision** 3 ft
Max. Width 4ft **Max. Depth** 2 ft **Gradient** 3% down, 9% up **Substrate** coarse gravel
Structure 60"x46" cmpa buried w/baffles **Passage** Yes **Timing dates** none
Narrative: 4-5% through length of existing 24 inch culvert. Bury pipe with baffles for retention of substrate to provide resident fish passage.

I) **MP** 5.448 **AHMU Class** 2 **Channel Type** MM1 **Incision** 5 feet
Max. Width 40 ft **Max. Depth** 3 ft **Gradient** 3% down, 2% up **Substrate** coarse gravel
Structure 50 ft modular bridge **Passage** Yes **Timing dates** none
Narrative: Snail Creek. Bridge will be left in place (so ATVs are not crossing in the stream channel). A berm will be established beyond the bridge so regular trucks can turn around.

J) **MP** 5.755 **AHMU Class** 3 **Channel Type** HC2 **Incision** 5 ft
Max. Width 8 ft **Max. Depth** 2 ft **Gradient** 11% down, 15% up **Substrate** cobbles and boulders
Structure 72 inch CMP **Passage** No **Timing dates** none
Narrative: Replace existing log stringer bridge.

K) **MP** 5.879 **AHMU Class** 3 **Channel Type** HC2 **Incision** 10-15 ft
Max. Width 12 ft **Max. Depth** 3 ft **Gradient** 12% down, 21% up **Substrate** cobbles and boulders
Structure 108 inch cmp **Passage** No **Timing dates** none
Narrative: Replace existing log stringer bridge.



Contour Interval 100 ft
Forest Development Roads
Temporary Roads
Unit Boundary
AHMU-Class I
AHMU-Class II
AHMU-Class III
AHMU-Class IV

RMO6594

0 1320 2640

Scale is 1 inch = 1320 feet

/gis/projects cow/rmo6594.map

Road Management Objectives

Project			System	Land Use Designation
Skipping Cow			Zarembo	TM
Route No	**Route Name**		**Begin Terminus**	**End Terminus**
6594	Mustang Lake		MP 6.36 existing Rd. 6594	last landing Unit 25, past slide
Begin MP	**Length**	**Status**	**Map Quarter Quad**	**Photo year, roll, photos**
6.36	2.37	Opportunity	Petersburg A-3 SW	1992 9 890-54

General Design Criteria and Elements

Functional Class	Service Life	Surface	Width	Design Speed	Critical Vehicle	Design Vehicle
Local	LI	shot rock	14'	10	Logging Truck	Logging Truck

Intended Purpose/Future Use
Access for recurring silvicultural activities. May be extended in the future to access timber past Kettle Creek.

Maintenance Criteria

Bmp	Emp	Operational Maintenance Level (Planned Initial Condition)	Objective Maintenance Level (Desired Future Condition)	Alaska Forest Practices Act Class
6.36	8.73	2		Active
6.36	7.47		1	Inactive
7.47	8.73		1	Closed

Maintenance Narrative
AFR&P Reg's. "inactive" status: After haul, Stormproof MP 6.36-7.47 by providing driveable waterbars/rolling dips.

AFR&P Reg's. "closed" status: Place road in storage, MP 7.47-8.73, remove or bypass culverts, add waterbars as needed.

Operation Criteria

Highway Safety Act: No **Jurisdiction:** National Forest ownership

Traffic Management Strategies		
	Encourage:	N/A
	Accept:	Hikers, bicycles and ATV's after timber harvest.
	Discourage:	N/A
	Prohibit:	Public traffic by road closure order during timber harvest and by berm and closure order (MP 5.45-8.73) after timber harvest.
	Eliminate:	Passenger and high clearance vehicles after timber harvest (MP 7.47-8.73).

Travel Management Narrative
A berm will be installed near the Snail Creek bridge. This is expected to be an effective barrier to passenger and high clearance vehicle use. By removing stream crossing structures past the junction of Road 52032, passenger and high clearance vehicle use will be further blocked.

Approved________________________ ______________

District Ranger   Date

Site Specific Design Criteria
Road 6594

ROAD LOCATION: The main location objective is to reach the ridge above the headwaters of Middle Meter Bight and Vial Creeks. This will allow uphill yarding which minimizes soil disturbance and gives more options for silvicultural systems other than clearcutting. Locating on the ridge also avoids the crossing of numerous fish streams that would be needed if Rd. 52004 were to be extended along the base of the ridge system. From the end of existing Rd. 6594 at MP 6.36, the route climbs at 15% favorable to reach an area of 8% sideslopes suitable for a 60' radius switchback, then continues to climb at 15% favorable to Vial Pass at MP 7.26. As the route follows the ridge down, it can be characterized as a steep logging road with sustained adverse grades of 15% with occasional grade breaks.

WETLANDS: At MP 6.76, the route breaks out of steep ground and arrives at a suitable switchback location which is on a soil classified as wetland. The route continues across the ridgetop, unavoidably on wetland soils, until the junction with Rd. 52032 at MP 7.47. The route crosses this soil type again from MP 7.66 to 7.98, but is mostly on drier forested ground between small muskegs.

EROSION CONTROL: An erosion control plan for construction and maintenance will be developed by the contractor and approved by the Contracting Officer (BMP 14.5). All areas of organic or mineral soil exposed during construction shall be grass seeded and fertilized (BMP 12.17,14.8). At MP 6.70 (~200' past Site 5) there is a 250' segment with sideslopes ranging from 40-60% downslope and 40-70% upslope 150-200' above Snail Creek. Full bench construction with endhaul will be required here. The approach to Site F will also require ~100 feet of full bench/endhaul. At MP 8.30 the road catches a bench with grade slacking to 0% through possible landing area. At the end of this bench sideslopes steepen, but there is another bench just below. To get down to this bench and back to gentle terrain requires ~300 ft. of full bench/end haul on 55-70% sideslopes. Controlled blasting techniques will be required. The route catches the bench just before the area that a relatively recent slide crossed the bench from above. This crossing of the slide is on a very stable bench area.

ROCK PITS: During periods of high rainfall (as defined in current Regional specifications), blasting operations will be suspended at quarries near potentially unstable sites where ground vibration may induce mass movement (BMP 14.6). Rock for initial construction is planned to come from the expansion of an existing pit at MP 4.94 on Rd. 6594. Three new rock pits are planned, each separated by about 2/3 of a mile. The first is located at MP 6.85 just past the first switchback. The second is at MP 7.47 at the junction with Rd. 52032 and will also be used to start Rd. 52032. The third is at MP 8.13 near the spur junction between Sites E & F. Each pit location has steeper topography adjacent to the bench the road is running on. The steep ground indicates rock is present while the gentler ground below provides a safe place to store the removed overburden.

STREAM CROSSINGS:

1) **MP** 6.42	**AHMU Class** 4	**Channel Type** HC5	**Incision** 10 ft
Max. Width 3-5 ft	**Max. Depth** 1 ft	**Gradient** 20%	**Substrate** angular cobbles
Structure 36 inch cmp	**Passage** No	**Timing dates** None	

Narrative: Stream is unit boundary.

2) **MP** 6.44	**AHMU Class** 3	**Channel Type** HC5	**Incision** 10 ft
Max. Width 6 ft	**Max. Depth** 2 ft	**Gradient** 30% up, 40% down	**Substrate** bedrock, angular cobbles
Structure 72 inch cmp	**Passage** No	**Timing dates** None	

Narrative: Heavy riprap needed at outlet.

3) **MP** 6.45	**AHMU Class** 4	**Channel Type** HC5	**Incision** 5-10 ft
Max. Width 2-6 ft	**Max. Depth** 1 ft	**Gradient** 25%	**Substrate** angular cobbles
Structure 36 inch cmp	**Passage** No	**Timing dates** None	

Narrative:

4) **MP** 6.51 **AHMU Class** 3 **Channel Type** HC5 **Incision** 5 ft
Max. Width 7 ft **Max. Depth** 3 ft **Gradient** 25% **Substrate** angular boulders, angular cobbles
Structure 95'x67" CMPA **Passage** No **Timing dates** None
Narrative: Falls below. More incision above.

5) **MP** 6.66 **AHMU Class** 3 **Channel Type** HC5 **Incision** 5-15 ft
Max. Width 3-4 ft **Max. Depth** 1.5 ft **Gradient** 30% up, 35% down **Substrate** angular cobbles, boulders
Structure 48 inch cmp **Passage** No **Timing dates** None
Narrative: For ~150 feet approaching this site sideslopes are 60% leading down to the creek, with road grade of 18% favorable. Full bench construction and endhaul of material is necessary.

A) **MP** 7.56 **AHMU Class** 3 **Channel Type** HC5 **Incision** 10 ft
Max. Width 4 ft **Max. Depth** 1.5 ft **Gradient** 20% **Substrate** not recorded
Structure 48 inch cmp **Passage** No **Timing dates** None
Narrative: Incision increases below. Cut 5 ft on far side. Adverse 15-18% grade for ~300 ft to next crossing.

B) **MP** 7.62 **AHMU Class** 3 **Channel Type** HC5 **Incision** 10-15 ft
Max. Width 5-6 ft **Max. Depth** 1.5 ft **Gradient** 20% **Substrate** bedrock
Structure 60' CMP **Passage** No **Timing dates** None
Narrative: Incision increases below.

C) **MP** 7.75 **AHMU Class** 4 **Channel Type** N/A **Incision** not recorded
Max. Width 2-4 ft **Max. Depth** 1 ft **Gradient** 20% **Substrate** bedrock, angular cobbles
Structure 36 inch cmp **Passage** No **Timing dates** none
Narrative:

D) **MP** 7.95 **AHMU Class** 3 **Channel Type** HC5 **Incision** 10 ft near bank, far bank gentle
Max. Width 4-6 ft **Max. Depth** 1.5 ft **Gradient** 10% **Substrate** white volcanic angular cobbles
Structure 48 inch CMP **Passage** No **Timing dates** none
Narrative: Near bank steep, far bank lower and gentle. Bedrock falls below.

E) **MP** 8.03 **AHMU Class** 4 **Channel Type** N/A **Incision** 10 ft
Max. Width 2-3 ft **Max. Depth** 1 ft **Gradient** not recorded **Substrate** angular cobbles
Structure 36" cmp **Passage** No **Timing dates** none
Narrative: Dry on 8/5/97, widens below.

F) **MP** 8.21 **AHMU Class** 4 **Channel Type** HC5 **Incision** 5 ft
Max. Width 2-5 ft **Max. Depth** 1 ft **Gradient** 30% **Substrate** bedrock
Structure 36 inch CMP **Passage** No **Timing dates** none
Narrative: 100 feet of full bench and endhaul approaching the crossing (white volcanic rock showing in sideslopes). Could not locate higher and still make the elevation needed for the landing past site G.

G) **MP** 8.30 **AHMU Class** 4 **Channel Type** N/A **Incision** 6 ft
Max. Width 3 ft **Max. Depth** 1 ft **Gradient** 10% **Substrate** not recorded
Structure 36 inch CMP **Passage** No **Timing dates** none
Narrative:

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Road Management Objectives

Project			System	Land Use Designation
Skipping Cow			Zarembo	SV
Route No	**Route Name**		**Begin Terminus**	**End Terminus**
52000	Roosevelt Harbor		MP 21.90 Rd. 6590	MP 0.2, Roosevelt Access Float
Begin MP	**Length**	**Status**	**Map Quarter Quad**	**Photo year, roll, photos**
0.0	0.20	Existing	Petersburg A-2 NW	

General Design Criteria and Elements

Functional Class	Service Life	Surface	Width	Design Speed	Critical Vehicle	Design Vehicle
Local	LC	shot rock	14'	10	Low-boy	Logging Truck

Intended Purpose/Future Use
Provides access to seaplane float, equipment offloading bulkhead, and staging area.

Maintenance Criteria

Bmp	Emp	Operational Maintenance Level (Current Condition)	Objective Maintenance Level (Desired Future Condition)	Alaska Forest Practices Act Class
0.00	0.20	3	3	Active

Maintenance Narrative
AFR&P Reg's. active status: Keep culverts, catchbasins, ditches and ditch blocks functional. Grade as needed to maintain crown and running surface. Control roadside brush to maintain sight distance.

Operation Criteria

Highway Safety Act: Yes **Jurisdiction:** National Forest ownership

Traffic Management Stategies		
	Encourage:	N/A
	Accept:	All vehicle and traffic types in accordance with Road Order No. R-10-96-01 (prohibits commercial hauling w/o permit, carelessness, exceeding load limits)
	Discourage:	NA
	Prohibit:	N/A
	Eliminate:	NA

Travel Management Narrative
Public travel on this isolated system is very low except during deer hunting season. Necessity of barging private vehicles makes this road system unattractive to other general public. During hunting season public traffic may conflict with commercial use, therefore warning signs will be posted.

Approved____ ______________________
District Ranger Date

Site Specific Design Criteria
Road 52000

ASSET REPLACEMENT: An existing log crib equipment offloading bulkhead in Roosevelt Harbor would be replaced in kind. The purpose of this work is to accommodate project equipment and the movement of material and supplies.

Other alternatives considered were no action and construction of a new facility at different locations. The no action alternative was not practicable because it did not accommodate equipment movement. The new construction at a different location alternative was not practicable because of the relatively small size of Roosevelt Harbor, existing seaplane/personnel float, and steep shorelines far removed from the existing road. Location of the facility at Deep Bay was also considered, but the same features as Roosevelt Harbor are present, except that Deep Bay does not have a seaplane float. Deep Bay does have a log transfer pier, but it is not usable as a equipment offloading bulkhead and it can't be modified to serve as one and function as an LTF.

Work would be confined to the existing bulkhead, landing, adjacent upland staging area, and access road footprint. The existing bulkhead is approximately 30 feet wide and the existing landing area contains approximately 1,500 square feet. The existing access road is approximately 150 feet long. All work would be confined to elevations above mean low water and no excavated material would be discharged on the aquatic ecosystem.

Work would consist of replacing the bulkhead, resurfacing the landing, access road and, adjacent upland staging area with clean shot rock, and constructing a non-point discharge elimination system to prevent surface runoff sedimentation from these areas. This construction would be the least environmentally damaging practicable alternative in order to fulfill the basic purpose of the proposed activity. There are no less damaging practicable alternatives available in the project area for the offloading of equipment.

The proposed work will require the following certifications or approvals:

1.) US Army Corps of Engineers Section 404 permit
2.) Alaska Department of Governmental Coordination Coastal Project Questionnaire
3.) Alaska Department of Environmental Conservation Certificate of Reasonable Assurance
4.) Alaska Department of Natural Resources Tideland Lease
5.) Environmental Protection Agency NPDES Storm Water General Permit

This project complies with the Environmental Protection Agency's 404 (b) (1) guidelines.

Road Management Objectives

Project			System	Land Use Designation
Skipping Cow			Zarembo	SV
Route No	**Route Name**		**Begin Terminus**	**End Terminus**
52001	Deep Bay LTF Access		MP 0.06 Rd. 52000	MP 0.39, Deep Bay LTF
Begin MP	**Length**	**Status**	**Map Quarter Quad**	**Photo year, roll, photos**
0.0	0.39	Existing	Petersburg A-2 NW	

General Design Criteria and Elements

Functional Class	Service Life	Surface	Width	Design Speed	Critical Vehicle	Design Vehicle
Collector	LC	shot rock	14'	10	Logging Truck	Logging Truck

Intended Purpose/Future Use
Provides access to Deep Bay Log Transfer Facility.

Maintenance Criteria

Bmp	Emp	Operational Maintenance Level (Current Condition)	Objective Maintenance Level (Desired Future Condition)	Alaska Forest Practices Act Class
0.00	0.39	3	3	Active

Maintenance Narrative
AFR&P Reg's. "active" status: Keep culverts, catchbasins, ditches and ditch blocks functional. Grade as needed to maintain crown and running surface. Control roadside brush to maintain sight distance. Roadway will be reconditioned (including culvert replacement) and resurfaced prior to log haul.

Operation Criteria

Highway Safety Act: Yes **Jurisdiction:** National Forest ownership

Traffic Management Stategies		
	Encourage:	N/A
	Accept:	All vehicle and traffic types in accordance with Road Order No. R-10-96-01 (prohibits commercial hauling w/o permit, carelessness, exceeding load limits)
	Discourage:	NA
	Prohibit:	N/A
	Eliminate:	NA

Travel Management Narrative
Public travel on this isolated system is very low except during deer hunting season. Necessity of barging private vehicles makes this road system unattractive to other general public. During hunting season public traffic may conflict with commercial use, therefore warning signs will be posted.

Approved______________________________
District Ranger

____
Date

Contour Interval 100 ft
Forest Development Roads
Temporary Roads
Unit Boundary
AHMU-Class I
AHMU-Class II
AHMU-Class III
AHMU-Class IV

RMO52032

0 1320 2640

Scale is 1 inch = 1320 feet

Road Management Objectives

Project			System	Land Use Designation
Skipping Cow			Zarembo	TM
Route No	**Route Name**		**Begin Terminus**	**End Terminus**
52032	Vial Pass		MP 7.47 Rd. 6594	spur junction MP 1.82
Begin MP	**Length**	**Status**	**Map Quarter Quad**	**Photo year, roll, photos**
0.00	1.82	Opportunity	Petersburg A-3 SW	'91, L10 590-244 & '92, 9 890-54

General Design Criteria and Elements

Functional Class	Service Life	Surface	Width	Design Speed	Critical Vehicle	Design Vehicle
Local	LI	Shot rock	14'	10	Logging Truck	Logging Truck

Intended Purpose/Future Use
Access for silvicultural activities. Will not be extended in the future.

Maintenance Criteria

Bmp	Emp	Operational Maintenance Level (Planned Initial Condition)	Objective Maintenance Level (Desired Future Condition)	Alaska Forest Practices Act Class
0.00	1.82	2		Active
0.00	1.82		1	Closed

Maintenance Narrative
AFR&P Reg's."active" status: Keep culverts, catchbasins, ditches and ditch blocks functional. Grade as needed to maintain crown and running surface. Control roadside brush to maintain sight distance.

AFR&P Reg's."closed" status: Place road in storage. Remove or bypass all drainage structures to restore natural drainage patterns, add waterbars as needed to control runoff. Replace crossings when needed in the future.

Operation Criteria

Highway Safety Act: No **Jurisdiction:** National Forest ownership

Traffic Management Strategies		
	Encourage:	N/A
	Accept:	Hikers, bicycles and ATV's after timber harvest.
	Discourage:	N/A
	Prohibit:	Public traffic during timber harvest by road closure order, all motorized vehicles by road closure order after timber harvest.
	Eliminate:	Passenger and high clearance vehicles after timber harvest.

Travel Management Narrative
The road would be closed after harvest by removing drainage structures and a berm at the beginning of the road.

Approved______________________________ __________________
District Ranger Date

Site Specific Design Criteria
Road 52032

ROAD LOCATION: The main location objective is to follow the timber along the ridge above Middle Meter Bight and Vial Creeks. This will allow uphill yarding which minimizes soil disturbance and gives more options for silvicultural systems other than clearcutting. Location on the ridge also avoids the crossing of numerous fish streams that would occur if road were to be built along the base of the ridge system. The road begins and ends at nearly the same elevation, with pitches to 15% (both adverse and favorable) encountered as dictated by topography.

WETLANDS: Along the slope break of the ridge the site changes from forested to alpine conditions. These soils are classified as wetlands (BMP 12.5). The objective is to stay below the alpine in the timber as much as possible. However, from MP 0.11 to 0.38 the road crosses the mapped alpine soil type. A portion of this segment (from Sites A to B) actually is located on a dry mixed conifer ridge between muskegs. A wetland soil type was crossed again between MP 0.66 and 0.86 (from Site E to just past Site G). This was necessary to hit a suitable stream crossing at Site F. The last 0.73 miles (MP's 1.09-1.82) parallels the edge of the wetland soil type ~300' away from the timber. Short temporary spurs run down finger ridges to landings in the timber, as necessitated by topography. Most of this segment is located on mixed conifer ground with the objective of minimizing impacts to peatland.

EROSION CONTROL: An erosion control plan for construction and maintenance will be developed by the contractor and approved by the Contracting Officer (BMP 14.5). All areas of organic or mineral soil exposed during construction shall be grass seeded and fertilized (BMP 12.17,14.8). At MP 1.24 (~300 ft. past Site H) the route must cross a 65% timbered slope for ~100 ft. Full bench construction is required. Sidecast material will catch on a bench just below.

ROCK PITS: During periods of high rainfall (as defined in current Regional specifications), blasting operations will be suspended at quarries near potentially unstable sites where ground vibration may induce mass movement (BMP 14.6). Rock for initial construction is planned to come from the proposed rock pit at the junction with Rd. 6594. Another rock pit at MP 1.09 is planned. Using the granitic rock at this location will provide area behind the road for artificial anchors. A landing is flagged here for timber below the road, but there are no large trees above the road for guyline anchors.

STREAM CROSSINGS:

A) **MP** 0.11	**AHMU Class** 4	**Channel Type** N/A	**Incision** none
Max. Width 3ft	**Max. Depth** 1 ft	**Gradient** 8%	**Substrate** angular cobbles and organics
Structure 36 inch CMP	**Passage** No	**Timing dates** none	

Narrative: Drains ponds above. Incision deepens to 15 ft just below crossing.

B) **MP** 0.18	**AHMU Class** 4	**Channel Type** N/A	**Incision** 5 ft
Max. Width 3 ft	**Max. Depth** 1 ft	**Gradient** 15%	**Substrate** organics, angular cobbles
Structure 36 inch CMP	**Passage** No	**Timing dates** none	

Narrative: Rounded banks, drains the ponds at helispot #6.

C) **MP** 0.45	**AHMU Class** 3	**Channel Type** HC6	**Incision** 10-15 ft
Max. Width 3-6 ft (mostly 4 ft)	**Max. Depth** 1.5 ft	**Gradient** 10%	**Substrate** angular cobbles, some bedrock
Structure 48 inch CMP	**Passage** No	**Timing dates** none	

Narrative: Crossing is located between a confluence above and deeper incision below.

D) **MP** 0.64 **AHMU Class** 3 **Channel Type** HC1 **Incision** 10 ft
Max. Width 4-6 ft **Max. Depth** 1.5 ft **Gradient** 20% **Substrate** bedrock, boulders
Structure 48 inch CMP **Passage** No **Timing dates** none

Narrative: Incision is wide and deep below, site is just above HC6 break.

E) **MP** 0.66 **AHMU Class** 4 **Channel Type** HC1 **Incision** 5 ft
Max. Width 4 ft **Max. Depth** 2 ft **Gradient** 5% **Substrate** angular cobbles and boulders
Structure 48 inch CMP **Passage** No **Timing dates** none

Narrative: 100 feet below this site the streams at D & E converge at a 20 ft bedrock falls. Cannot cross either D or E any lower.

F) **MP** 0.74 **AHMU Class** 4 **Channel Type** HC1 **Incision** 6-8 feet
Max. Width 4 ft **Max. Depth** 1.5ft **Gradient** 15% **Substrate** bedrock, angular cobbles, boulders
Structure 48 inch CMP **Passage** No **Timing dates** none

Narrative: Streambed is 10 feet wide right at crossing due to a large boulder in the middle of the creek diverting flow. Alders along stream bank. Tried crossing lower but could not because V-notch too wide and deep.

G) **MP** 0.83 **AHMU Class** 4 **Channel Type** N/A **Incision** none
Max. Width 3 ft **Max. Depth** 1 ft **Gradient** 8% **Substrate** angular cobbles
Structure 24 inch CMP **Passage** No **Timing dates** none

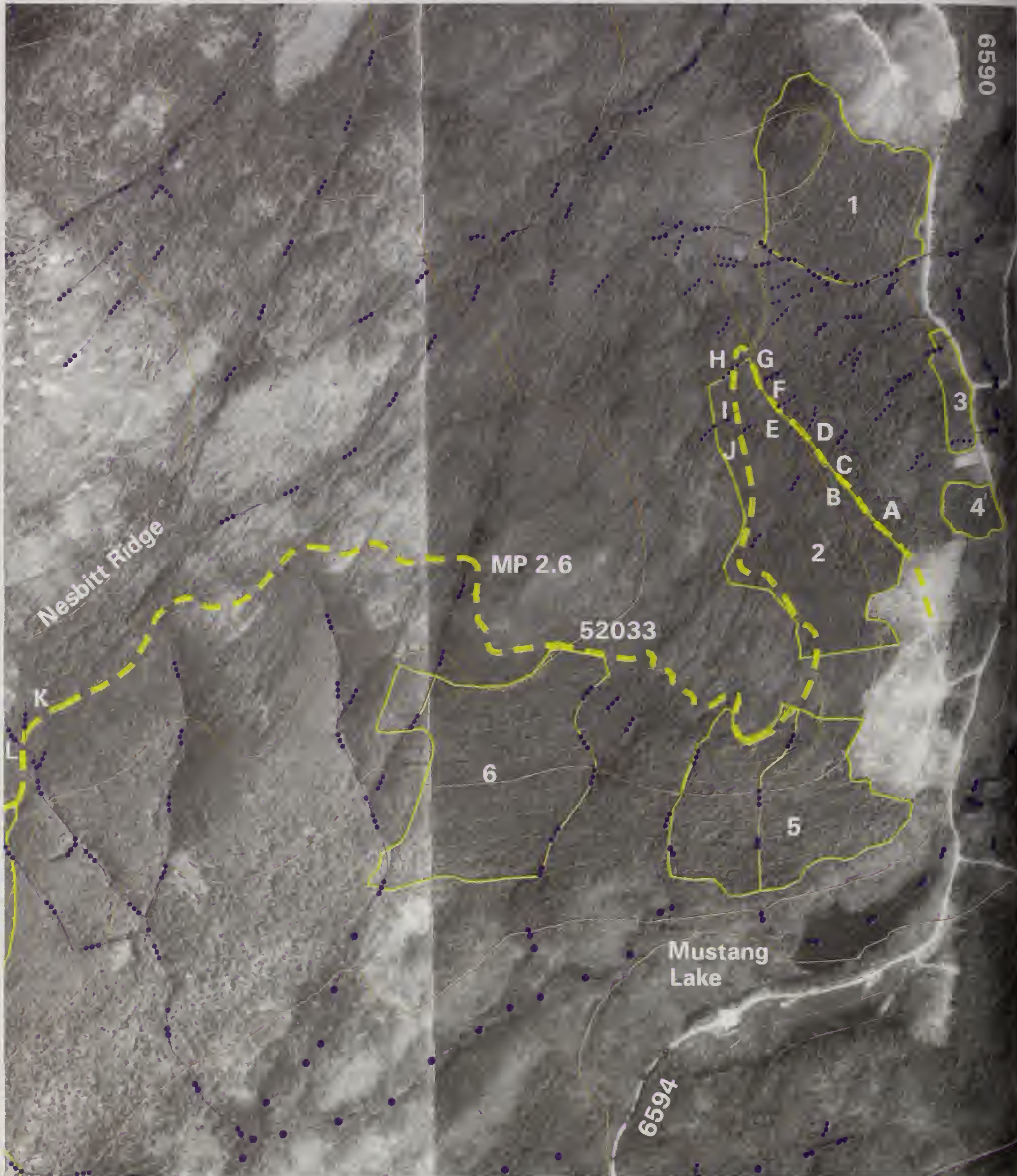
Narrative: Small swale with muskeg banks.

H) **MP** 1.19 **AHMU Class** 4 **Channel Type** N/A **Incision** none
Max. Width 3 ft **Max. Depth** 1 ft **Gradient** 2 % **Substrate** not recorded
Structure 24 inch CMP **Passage** No **Timing dates** none

Narrative: Outlet of small pond.

I) **MP** 1.75 **AHMU Class** 3 **Channel Type** HC1 **Incision** 6 feet
Max. Width 9-10 ft **Max. Depth** 2 ft **Gradient** 10% **Substrate** white volcanic bedrock
Structure 40' log stringer bridge **Passage** No **Timing dates** none

Narrative: This is the lowest suitable crossing site that allowed route to gain the required elevation to continue.



Contour Interval 100 ft
Forest Development Roads
Temporary Roads
Unit Boundary
AHMU-Class I
AHMU-Class II
AHMU-Class III
AHMU-Class IV

RMO52033N

0 1320 2640

Scale is 1 inch = 1320 feet

\gis projects cow rmo52033n.map

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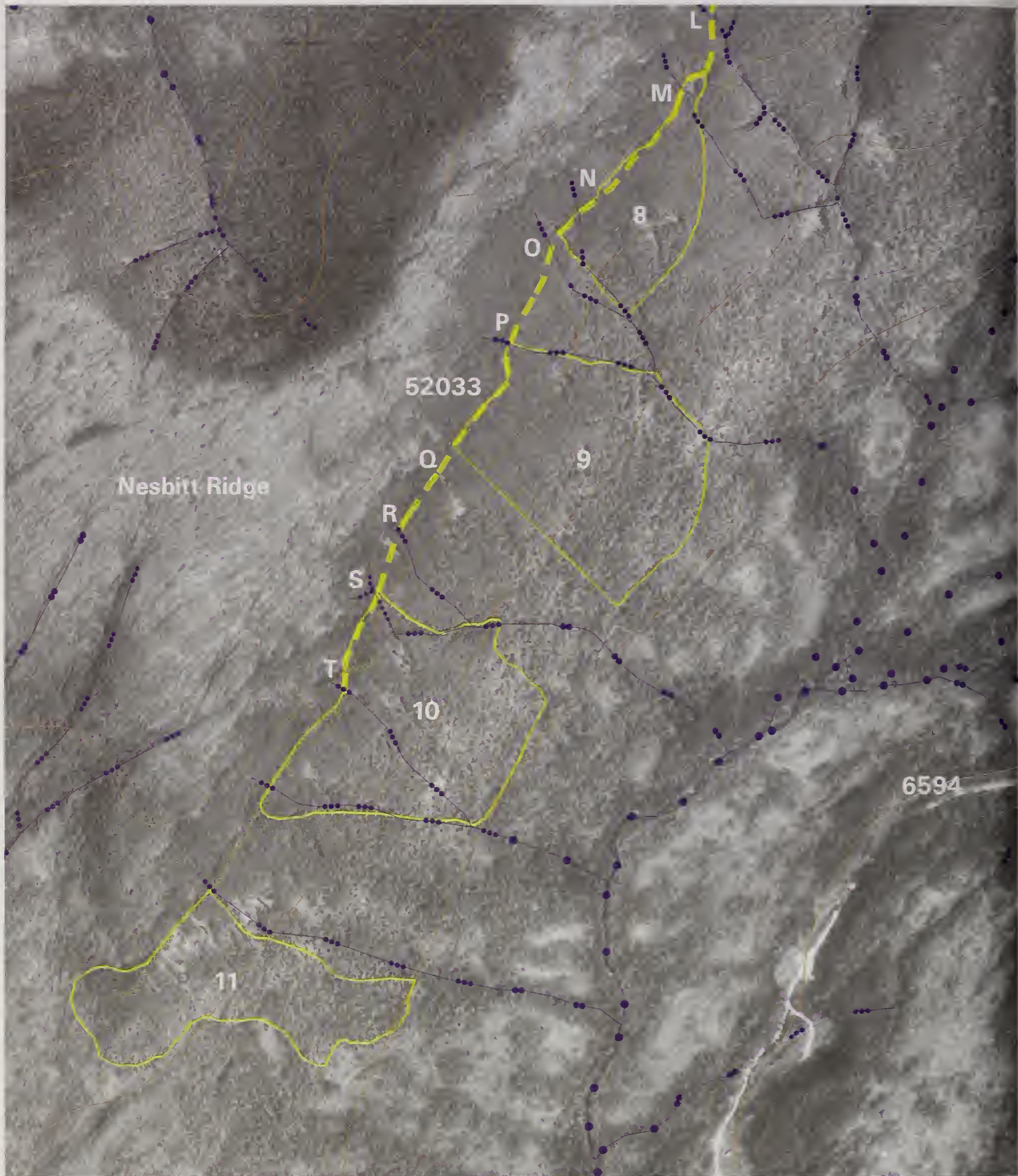

Contour Interval 100 ft
Forest Development Roads
Temporary Roads
Unit Boundary
AHMU-Class I
AHMU-Class II
AHMU-Class III
AHMU-Class IV

RMO52033S

0 1320 2640

Scale is 1 inch = 1320 feet

/gis/projects/cow/rmo52033s.map 01 21 99

Road Management Objectives

Project			System	Land Use Designation
Skipping Cow			Zarembo	TM
Route No	**Route Name**		**Begin Terminus**	**End Terminus**
52033	Nesbitt Ridge		MP 0.59 Rd. 6594	last landing in Unit 8
Begin MP	**Length**	**Status**	**Map Quarter Quad**	**Photo year, roll, photos**
0.00	4.22	Opportunity	Petersburg A-3 SW	'92 9-59 & '91 L8N-11

General Design Criteria and Elements

Functional Class	Service Life	Surface	Width	Design Speed	Critical Vehicle	Design Vehicle
Local	LI	Shot rock	14'	10	Logging Truck	Logging Truck

Intended Purpose/Future Use
Access for general forest management and administration. Road may be extended ~2 miles along the ridgetop in the future.

Maintenance Criteria

Bmp	Emp	Operational Maintenance Level (Planned Initial Condition)	Objective Maintenance Level (Desired Future Condition)	Alaska Forest Practices Act Class
0.00	4.22	2		Active
0.00	4.22		1	Closed

Maintenance Narrative
AFR&P Reg's. "active" status: Keep culverts, catchbasins, ditches and road blocks functional. Grade as needed to maintain crown and running surface. Control roadside brush to maintain sight distance.

AFR&P Reg's."closed" status: Place road in storage. Remove or bypass all drainage structures to restore natural drainage patterns, add waterbars as needed to control runoff. Replace crossings when needed in the future.

Operation Criteria

Highway Safety Act: No **Jurisdiction:** National Forest ownership

Traffic Management Stategies		
	Encourage:	N/A
	Accept:	Hikers, bicycles
	Discourage:	N/A
	Prohibit:	All motorized public traffic through road closure order during timber harvest and by gate.
	Eliminate:	All motorized traffic after timber harvest (enforced by road order).

Travel Management Narrative
The road would be closed by removing drainage structures, placing barrier boulders at the stream crossing with vertical rock banks (MP 0.82, Site F) and by placing a barrier berm at junction with Road 6594 (MP 0.0, Road 52033). The road closure would be enforced by a Road Order prohibiting motorized use of the road.

Approved____________________ ____________
District Ranger Date

Site Specific Design Criteria
Road 52033

NOTE: Site specifice design criteria are listed for the road opportunity to milepost 5.39 (crossing Site T). Under the Preferred Alternative the road will end at MP 4.22 for this project.

ROAD LOCATION: The main location objective is to reach and follow Nesbitt Ridge to provide uphill yarding and avoid the crossings of fish streams that would be needed if the road was located along the base of the ridge. The first 0.23 miles follows the location of an existing temporary spur. The grade of the existing spur is 15-17% favorable. Sustained grades of 15% favorable with short grade breaks are necessary up to the ridgetop. Following the ridge down, pitches of 15% adverse are common in transition areas between relatively flat benches.

WETLANDS: At the top of the ridge the site changes from forested to alpine conditions. These soils are classified as wetlands (BMP 12.5). The objective is to stay below the alpine in the timber as much as possible. However, from MP 1.63 to 3.38 the road skirts in and out of the alpine soil type. A wetland soil type was crossed again at MP 5.25 for ~500' (between Sites S and T). This was necessary because staying in the timber would have forced the crossing of a large V-notch, instead of the shallowly incised area at Site T.

EROSION CONTROL: An erosion control plan for construction and maintenance will be developed by the contractor and approved by the Contracting Officer (BMP 14.5). All areas of organic or mineral soil exposed during construction shall be grass seeded and fertilized (BMP 12.17,14.8)

ROCK PITS: During periods of high rainfall (as defined in current Regional specifications), blasting operations will be suspended at quarries near potentially unstable sites where ground vibration may induce mass movement (BMP 14.6). Rock for initial construction is planned to come from the expansion of an existing rock pit at MP 0.54 on Rd. 6594. Thereafter, new rock pits are proposed along the route separated by from 0.67-1.14 miles. The proposed sites all take advantage of locations where rock cutting will be necessary anyway. The pit at MP 0.54 uses the same meta/sed rock formation that is exposed at Sites B & C. The next pit at MP 1.46 takes advantage of a granitic rock nose that must be cut through. At MP 2.60 exists a fault generated cliff. There is no water in the swale below as it is at the watershed divide. ~100' of full bench cut on 80% rock sideslope is required to get past this point. Locating a quarry here will help minimize adverse grade through this section. A pit at MP 3.68 uses the rock exposed at Sites K & L. The rest of the route lies along a series of NE/SE bearing benches. The last two quarries at MP's 4.43 and 5.10 are located on the transitions between benches where construction changes from overlay to rock cut.

STREAM CROSSINGS:

A) **MP** 0.44	**AHMU Class** 4	**Channel Type** N/A	**Incision** none
Max. Width 3ft	**Max. Depth** 0.5 ft	**Gradient** 35%	**Substrate** angular cobbles and boulders
Structure 36 inch CMP	**Passage** No	**Timing dates** none	

Narrative:

B) **MP** 0.60	**AHMU Class** 4	**Channel Type** N/A	**Incision** 3 ft
Max. Width 3 ft	**Max. Depth** 1 ft	**Gradient** 45%	**Substrate** bedrock
Structure 48 inch CMP	**Passage** No	**Timing dates** none	

Narrative: Bedrock cleft.

C) **MP** 0.62	**AHMU Class** 4	**Channel Type** HC5	**Incision** 3 ft
Max. Width 5 ft	**Max. Depth** 1.5 ft	**Gradient** 25% through, 45% above & below	**Substrate** bedrock
Structure 48 inch CMP	**Passage** No	**Timing dates** none	

Narrative: Meta/sed bedrock steps, falls with natural baffles into inlet area. Granite intrusion below. V-shaped channel.

D) **MP** 0.68	**AHMU Class** 4	**Channel Type** HC5	**Incision** 8 ft
Max. Width 5 ft	**Max. Depth** 0.5 ft	**Gradient** 20%	**Substrate** sand, organics
Structure 36 inch CMP	**Passage** No	**Timing dates** none	

Narrative: 8 foot rounded banks, skunk cabbage growing in channel.

E) **MP** 0.75	**AHMU Class** 3	**Channel Type** HC5	**Incision** 5-15 ft
Max. Width 4 ft	**Max. Depth** 1.5 ft	**Gradient** 20%	**Substrate** angular cobbles and boulders
Structure 48 inch CMP	**Passage** No	**Timing dates** none	

Narrative: About 10-15 feet of fill required. Falls just above crossing site.

F) **MP** 0.82	**AHMU Class** 3	**Channel Type** HC5	**Incision** 8-10 ft vertical rock banks
Max. Width 6 ft	**Max. Depth** 1.5ft	**Gradient** 20%	**Substrate** meta/sed bedrock, angular cobbles
Structure 72 inch CMP or 30' bridge	**Passage** No	**Timing dates** none	

Narrative: Road grade is 0% through crossing on gentle ground. In confined V-shaped section the maximum depth was 3' by 6' for an area of 9 sq. ft. (rock notch)

G) **MP** 0.88	**AHMU Class** 4	**Channel Type** N/A	**Incision** 3 ft
Max. Width 2-4 ft	**Max. Depth** 1 ft	**Gradient** 20%	**Substrate** angular cobbles
Structure 36 inch CMP	**Passage** No	**Timing dates** none	

Narrative: ~100 feet before 50 ft radius switchback.

H) **MP** 0.94	**AHMU Class** 4	**Channel Type** N/A	**Incision** 3 ft
Max. Width 2-4 ft	**Max. Depth** 1 ft	**Gradient** 25%	**Substrate** angular cobbles
Structure 36 inch CMP	**Passage** No	**Timing dates** none	

Narrative: Just past PT of 50' radius switchback that controls location. Meta/sed bedrock dike across channel. Same stream as Site G, only higher on hillslope.

I) **MP** 1.02	**AHMU Class** 3	**Channel Type** HC5	**Incision** 20 feet
Max. Width 5 ft	**Max. Depth** 1.5 ft	**Gradient** 15% thru, 40% below	**Substrate** meta/sed bedrock, boulders
Structure 72 inch CMP	**Passage** No	**Timing dates** none	

Narrative: Falls located just above. Tried crossing 80' higher up at top of falls, but never made it down to a good switchback location. Road grade is flagged at 15% favorable through this site. This is the most difficult site on the road, with 20' vertical bedrock banks.

J) **MP** 1.10	**AHMU Class** 4	**Channel Type** N/A	**Incision** slight
Max. Width 3 ft	**Max. Depth** 1 ft	**Gradient** 35%	**Substrate** angular cobbles, boulders and bedrock
Structure 36 inch CMP	**Passage** No	**Timing dates** none	

Narrative: Same stream as site E, only higher on hillslope.

K) **MP** 3.78	**AHMU Class** 4	**Channel Type** HC5	**Incision** 3-5 ft
Max. Width 4-6 ft	**Max. Depth** 1.5ft	**Gradient** 20% up, 30% down	**Substrate** angular cobbles, bedrock
Structure 48 inch CMP	**Passage** No	**Timing dates** none	

Narrative: Channel is stair-stepped by intrusive bedrock dikes.

L) **MP** 3.80	**AHMU Class** 4	**Channel Type** HC5	**Incision** 3-5 ft, deeper above
Max. Width 4ft	**Max. Depth** 1.5ft	**Gradient** 25%	**Substrate** angular cobbles,

bedrock

Structure 48 inch CMP | **Passage** No | **Timing dates** none

Narrative: Channel is stair-stepped by intrusive bedrock dikes. Falls just below site.

M) **MP** 4.02 | **AHMU Class** 3 | **Channel Type** HC5 | **Incision** 15 ft
Max. Width 6 ft | **Max. Depth** 1.5ft | **Gradient** 15% | **Substrate** angular cobbles
Structure 60 inch CMP | **Passage** No | **Timing dates** none

Narrative: Crossing just below confluence.

Note: Road ends at MP 4.22 under the Preferred Alternative.

N) **MP** 4.37 | **AHMU Class** 4 | **Channel Type** N/A | **Incision** 5 ft deep bowl
Max. Width 3 ft | **Max. Depth** 0.5ft | **Gradient** 18% | **Substrate** angular cobbles
Structure 24 inch CMP | **Passage** No | **Timing dates** none

Narrative: Cobbles are moss covered, with 1 ft active width.

O) **MP** 4.49 | **AHMU Class** 4 | **Channel Type** HC5 | **Incision** none
Max. Width 4-6 ft | **Max. Depth** 1 ft | **Gradient** 20% | **Substrate** angular cobbles
Structure 48 inch CMP | **Passage** No | **Timing dates** none

Narrative: Dry wash most of the time.

P) **MP** 4.61 | **AHMU Class** 4 | **Channel Type** HC5 | **Incision** 2-3 feet
Max. Width 3-5 ft | **Max. Depth** 1.5 ft | **Gradient** 20% | **Substrate** angular cobbles w/mossy boulder steps
Structure 48 inch CMP | **Passage** No | **Timing dates** none

Narrative: None

Q) **MP** 4.91 | **AHMU Class** 4 | **Channel Type** N/A | **Incision** none
Max. Width 3 ft | **Max. Depth** 0.5 ft | **Gradient** 12% | **Substrate** angular cobbles
Structure 24 inch CMP | **Passage** NO | **Timing dates** none

Narrative:

R) **MP** 5.02 | **AHMU Class** 4 | **Channel Type** N/A | **Incision** 2-3 ft
Max. Width 3 ft | **Max. Depth** 0.5 ft | **Gradient** 25% | **Substrate** angular cobbles
Structure 24 inch CMP | **Passage** No | **Timing dates** none

Narrative:

S) **MP** 5.18 | **AHMU Class** 3 | **Channel Type** HC5 | **Incision** 10 ft
Max. Width 6 ft | **Max. Depth** 1.5 ft | **Gradient** 15% | **Substrate** angular cobbles and boulders
Structure 60 inch CMP | **Passage** No | **Timing dates** none

Narrative: Bedrock under rubble substrate. Falls above. Water flowing even after long period of dry weather.

T) **MP** 5.39 | **AHMU Class** 4 | **Channel Type** HC5 | **Incision** 5 ft
Max. Width 5 ft | **Max. Depth** 1 ft | **Gradient** 15% | **Substrate** angular cobbles
Structure 36 inch CMP | **Passage** No | **Timing dates** none

Narrative: Bedrock steps leading into site. Stream 4' x 1' in muskeg just above.

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Middle Meter Bight Creek
Mustang Ridge
B
13
C
D
E
F
G
52034
H
I
J
14
15
18
16
52032
M
L
K
19
52034
17
Contour Interval 100 ft
Forest Development Roads
Temporary Roads
Unit Boundary
AHMU Class I
AHMU-Class II
AHMU-Class III
AHMU-Class IV
RMO52034
0
1320
2640
Scale is 1 inch = 1320 feet

Road Management Objectives

Project			System	Land Use Designation
Skipping Cow			Zarembo	TM
Route No	**Route Name**		**Begin Terminus**	**End Terminus**
52034	Vial Divide		MP 1.30 Rd. 52032	stream at mp2.20 west end Unit 13
Begin MP	**Length**	**Status**	**Map Quarter Quad**	**Photo year, roll, photos**
0.00	2.20	Opportunity	Petersburg A-3 SW	'91 L10-244

General Design Criteria and Elements

Functional Class	Service Life	Surface	Width	Design Speed	Critical Vehicle	Design Vehicle
Local	LI	Shot rock	14'	10	Logging Truck	Logging Truck

Intended Purpose/Future Use

Provides access into Middle Meter Bight valley while avoiding Old Growth Reserve. All suitable land harvested this entry. Next anticipated use possible commercial thin in 50-70 years.

Maintenance Criteria

Bmp	Emp	Operational Maintenance Level (Planned Initial Condition)	Objective Maintenance Level (Desired Future Condition)	Alaska Forest Practices Act Class
0.00	2.20	2		Active
0.00	2.20		1	Closed

Maintenance Narrative

AFR&P Reg's. "active" status: Keep culverts, catchbasins, ditches and ditch blocks functional. Grade as needed to maintain crown and running surface. Control roadside brush to maintain sight distance.

AFR&P Reg's. "closed" status: Place road in storage. Remove or bypass all drainage structures to restore natural drainage patterns, add waterbars as needed to control runoff. Replace crossings when needed in future.

Operation Criteria

Highway Safety Act: No **Jurisdiction:** National Forest ownership

Traffic Management Strategies		
	Encourage:	N/A
	Accept:	Hikers, bicycles and ATV's after timber harvest.
	Discourage:	N/A
	Prohibit:	Public traffic during timber harvest by road closure order, all motorized vehicles by road closure order after timber harvest.
	Eliminate:	Passenger and high clearance vehicles after timber harvest.

Travel Management Narrative

Access for passenger and high clearance vehicles will be blocked by a berm near Snail Creek on Rd. 6594, and removed crossing structures on Rds. 52032 and 52034.

Approved______________________________ ________________

District Ranger Date

Site Specific Design Criteria
Road 52034

ROAD LOCATION: The main location objective is to provide an alternative to extending Rd. 52004 to reach the timber stands on the south side of the Middle Meter Bight valley. This requires dropping down from Rd 52032 on Mustang Ridge above the headwaters of Vial Creek, mostly at 15% adverse grade on slopes 20-70% (see Erosion Control below). The road then crosses the muskeg that is the watershed divide between Vial and Middle Meter Bight Creek and hits a stream crossing control point at Site K. From this point the location objective is to stay within productive forest land while running down the south side of the Middle Meter Bight valley (the north side is in designated Old Growth Habitat). Location is controlled by several stream crossings along the route and the objectives of staying above the wetlands in the valley bottom as much as possible, and off the steep slopes to the south.

WETLANDS: Along the slope break of Mustang Ridge the site changes from forested to alpine conditions. These soils are classified as wetlands (BMP 12.5). The first ~300' crosses this wetland before descending onto the forested hillside. Once at the bottom of the hill the route must cross the muskeg/forest complex wetland along the watershed divide from MP 0.43 to MP 0.82 in order to reach the timbered hillside on the south side of the valley.

From MP 0.82 (Site K) to MP 1.30 the road traverses along the edge of a mapped wetland in order to stay off steeper slopes above which would require more ground disturbance. Care was taken to locate the road along the forested fringe of the muskeg and off the peatland. To get down from the forested slope at MP 1.30 to the control point at MP 1.48 (crossing Site J) requires crossing through muskeg/forested mosaic soils at 15% adverse grade. From MP 1.48 to 2.13 the road stays just above the wetland. Between MP's 2.13-2.17 the very top of a small muskeg is crossed in order to adequately approach (from the west) the stream crossing at Site E (MP 2.11).

EROSION CONTROL: An erosion control plan for construction and maintenance will be developed by the contractor and approved by the Contracting Officer (BMP 14.5). All areas of organic or mineral soil exposed during construction shall be grass seeded and fertilized (BMP 12.17,14.8).). In order to descend off of Mustang Ridge the route had to cross two areas of 70% sideslopes. At MP 0.25 ~200 feet of full bench construction is required. A bench is located just below. Again at MP 0.35 ~250 feet of full bench construction is required. The valley bottom is located just below this segment. These segments of steep construction were considered preferable to crossing lands designated as Old Growth Habitat.

ROCK PITS: During periods of high rainfall (as defined in current Regional specifications), blasting operations will be suspended at quarries near potentially unstable sites where ground vibration may induce mass movement (BMP 14.6). Rock for initial construction is planned to come from the proposed quarry at MP 1.09 on Rd. 52032. Another borrow source is planned at MP 1.20 (~ 1500' before Site J).

STREAM CROSSINGS:

A) Crossing of Middle Meter Bight tributary (Class II), which borders Old Growth Reserve, was dropped from consideration in all alternatives.

B) MP 2.62	**AHMU Class** 4	**Channel Type** N/A	**Incision** none
Max. Width 3 ft	**Max. Depth** 1 ft	**Gradient** 15%	**Substrate** sand, cobbles
Structure 24 inch CMP	**Passage** No	**Timing dates** none	

Narrative: Skunk cabbage in channel. Note: The section of road past MP 2.20 is planned as a temporary spur.

C) MP 2.20	**AHMU Class** 3	**Channel Type** HC5	**Incision** none
Max. Width 15 ft	**Max. Depth** 1.5 ft	**Gradient** 15%	**Substrate** angular cobbles, boulders
Structure 25' log stringer bridge	**Passage** No	**Timing dates** none	

Narrative: Located in an alluvial area just above a bedrock falls.

D) MP 2.19	**AHMU Class** 3	**Channel Type** HC5	**Incision** none
Max. Width 4-6 ft	**Max. Depth** 1 ft	**Gradient** 15%	**Substrate** angular cobbles, boulders
Structure 48 inch CMP	**Passage** No	**Timing dates** none	

Narrative: 6 foot floodplain, located in an alluvial area just above a bedrock falls, 40 feet past site C. Tried crossing just below confluence of C and D and the falls but did not due to widening of the canyon.

E) **MP** 2.11	**AHMU Class** 4	**Channel Type** HC5	**Incision** 3 feet
Max. Width 3-4 ft	**Max. Depth** 2 ft	**Gradient** 25%	**Substrate** angular and rounded cobbles and boulders
Structure 48 inch CMP	**Passage** No	**Timing dates** none	

Narrative:

F) **MP** 2.05	**AHMU Class** 3	**Channel Type** HC2	**Incision** 5 ft indistinct
Max. Width 8 ft	**Max. Depth** 2 ft	**Gradient** 12%	**Substrate** rounded boulders
Structure 25' log stringer bridge	**Passage** No	**Timing dates** none	

Narrative:

G) **MP** 1.80	**AHMU Class** 3	**Channel Type** HC5	**Incision** none
Max. Width 4-6 ft	**Max. Depth** 1.5 ft	**Gradient** 30%	**Substrate** angular cobbles, boulders
Structure 60 inch CMP	**Passage** No	**Timing dates** none	

Narrative: Crossing an alluvial channel below a debris jam.

H) **MP** 1.69	**AHMU Class** 4	**Channel Type** N/A	**Incision** none
Max. Width 3 ft	**Max. Depth** 1 ft	**Gradient** 20%	**Substrate** angular cobbles
Structure 36 inch CMP	**Passage** No	**Timing dates** none	

Narrative:

I) **MP** 1.55	**AHMU Class** 4	**Channel Type** N/A	**Incision** none
Max. Width 2 ft	**Max. Depth** 1 ft	**Gradient** N/A	**Substrate** N/A
Structure 24 inch CMP	**Passage** No	**Timing dates** none	

Narrative:

J) **MP** 1.48	**AHMU Class** 3	**Channel Type** HC5	**Incision** 15 ft
Max. Width 10 ft	**Max. Depth** 1 ft	**Gradient** 17%	**Substrate** bedrock, angular cobbles, and boulders
Structure 60' modular bridge	**Passage** No	**Timing dates** none	

Narrative: This is the site with the lowest banks on this large V-notch. Rock walls are generally 20' high.

K) **MP** 0.82	**AHMU Class** 3	**Channel Type** HC2	**Incision** 5' near, 10' far bank
Max. Width 10 ft	**Max. Depth** 2 ft	**Gradient** 8%	**Substrate** angular cobbles, boulders
Structure 40' log bridge	**Passage** No	**Timing dates** none	

Narrative: Stream goes alluvial just below the bedrock control at this site. 6 ft falls ~600 ft below crossing site.

L) **MP** 0.12	**AHMU Class** 4	**Channel Type** N/A	**Incision** none
Max. Width 2ft	**Max. Depth** 0.5ft	**Gradient** not recorded	**Substrate** not recorded
Structure 24 inch CMP	**Passage** No	**Timing dates** none	

Narrative:

M) **MP** 0.10	**AHMU Class** 4	**Channel Type** N/A	**Incision** 20 ft
Max. Width 3 ft	**Max. Depth** 0.5ft	**Gradient** 5%	**Substrate** sand, gravel and organics
Structure 36 inch CMP	**Passage** No	**Timing dates** none	

Narrative:

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Appendix D

Mitigation

Appendix D

General Mitigation Measures

These general mitigation measures apply to all units and roads in the Project Area. They may also apply to other portions of the Project Area. The source(s) of each general measure are listed after the measure in terms of individual Forest Plan Standards and Guidelines (see Chapter 4 of the Forest Plan) or BMPs (see Appendix C of the Forest Plan and Chapter 10 of FSH 2509.22, Region 10 Soil and Water Conservation Handbook). Specific mitigation measures that are applied to selected units and/or roads in a project are identified in the section that follows the general measures.

Air Quality Protection: Design projects to control air pollution impacts and to ensure that the predicted emissions from all pollution sources do not exceed ambient air quality standards, as specified under the Alaska Administration Code, Title 18, Chapter 50; applicable permits will be obtained from ADEC for all projects (AIR 112).

Soil/Water Protection during Timber Sale Planning: Incorporate soil and water resource considerations into timber sale planning. Include site-specific considerations, site preparation, designating water quality protection needs on sale area maps, locating and designing landings for good drainage and dispersion of water, incorporating erosion control and timing responsibilities into the Operating Schedule, scheduling and enforcement of erosion control during and at completion of the timber sale, including non-recurring "C" provisions to protect soil and water resources in timber sale contracts, and seeking an environmental modification of the contract if new circumstances or conditions indicate that soil, water, or watershed damage may occur. (BMPs 13.1, 13.2, 13.3, 13.4, 13.10, 13.11, 13.12, 13.14, 13.17, and 13.18)

Soil/Water Protection during Road Development: Implement measures to reduce surface erosion and drainage interruption related to transportation including water barring and cross-draining roads using ditches and culverts to prevent water running long distances over roads, closure, and seeding and fertilizing cut-and-fill slopes. (BMPs 14.1, 14.2, 14.3, 14.5, 14.7, 14.8, 14.9, 14.10, 14.11, 14.12, and 14.19)

Soil/Water Protection during Road Management: Conduct road maintenance and snow removal operations to minimize disruption of road surfaces, embankments, ditches, and drainage facilities, and use road closures or other measures to keep road surface and road site erosion at low or background levels. (TRAN23-I, BMPs 14.20 and 14.23)

Management of Road Use to Reduce Erosion and Sedimentation: Control access and manage road use to reduce the risk of erosion and sedimentation from road surface disturbance especially during the higher risk periods associated with high runoff and spring thaw conditions. (BMP 14.22)

Temporary Road Obliteration: Obliterate temporary roads after use, remove or bypass drainage structures and install waterbars in appropriate places. (RIP2-II and BMPs 12.17 and 14.24)

Soil/Water Protection during Development of Rock Sources, LTFs, & Other Facilities: Implement measures to reduce surface erosion and other impacts on soils and water from gravel sources and quarries, LTFs, sort yards, and other facilities. (BMPs 14.18, 14.19, 14.25, 14.26, and 14.27)

Sanitation at Facilities: Comply with all regulations for the disposal of sewage at camps, LTFs, and other facilities; require incinerators and/or other bear-proof garbage disposal methods at work camps. (FAC1, FAC22, WILD112-VI, BMP 12.10, 12.15, and 12.16).

Accidental Spills: Implement measures and plans to prevent the contamination of soil and water from accidental spills of petroleum products and hazardous substances. (BMP 12.8 and 12.9)

Heritage Site Discovery: Suspend work if a heritage site is discovered during project implementation. Authorize resumption of work only after consultation with the State Historic Preservation Office is complete.

Maximum Size of Created Openings: Limit created openings to a maximum size of 100 acres. (TIM114-IV)

Maintain Advanced Regeneration: Maintain advanced regeneration within the units to meet reforestation needs and stand objectives. (TIM111-2-I)

Maintain Minor Tree Species: Selectively maintain minor tree species (e.g., yellow-cedar, western redcedar, Pacific yew) where appropriate for the site, as viable components of the future stand, for vegetative diversity, and for seed trees. (TIM111-2-I, TIM114-II)

Windthrow Hazards Along the Boundaries of Protected LUDs: Take measures that protect LUDs which prohibit timber harvest activities from harvest- related windthrow. (TIM114-XII)

Certification of Reforestation: Certify that every unit that receives a final harvest meets or surpasses the stocking guidelines and certification standards (FSH 2409.17) within 5 years. (TIM24)

Wetland Protection: Minimize the loss of all wetlands, but particularly the higher value wetlands (especially fens), and minimize the adverse impacts of land management activities on wetlands; follow Executive Order 11990 and the BMPs. (WET-I, WET-III, BMP 12.5)

Protection of Waterfowl: Modify a road design to keep habitat changes as far from known waterfowl and brooding areas as feasible (at least 300 feet). (WILD112-IX)

Beach and Estuary Fringe Protection: Avoid harvest within the beach and estuary fringe; avoid road construction within this zone, except where no feasible alternative exists. (BEACH 2)

Non-Development LUD Protection: Avoid timber harvest impacts and minimize road construction within non-development LUDs such as Old-Growth Habitat, Remote and Semi-Remote Recreation, and Wild and Scenic River corridors.

Connectivity Between Old Growth Reserves: Provide corridors of old growth forest between medium old-growth reserves. Where sufficient connectivity does not exist, or where the minimum Forest Plan criteria are not met, relocate or redesign mapped, small old growth reserves. (WILD112-XVIII)

Marine Mammal Protection: Ensure that Forest Service permitted or approved activities are conducted in a manner consistent with the Marine Mammal Protection Act, the ESA, and NMFS regulations for approaching whales, dolphins, porpoises, seals, and sea lions. Site camps, LTFs, and other facilities at least one mile away from known Stellar sea lion haulouts. (TE&S-I)

Site-specific Mitigation Measures Incorporated into Unit and Road Design

The specific mitigation measures that are applied to selected units and/or roads are identified in this section. The source(s) of each general measure are listed after the measure in terms of individual Forest Plan Standards and Guidelines (see Chapter 4 of the Forest Plan) or BMPs (see Appendix C of the Forest Plan and Chapter 10 of FSH 2509.22, Region Soil and Water Conservation Handbook). A table showing the units to which the specific measures apply is contained in Appendix D.

Fish, Water, and Soils

F1 Riparian Buffers: Establish no-harvest and selective cut buffers along streams and around lakes to protect riparian areas as defined by the Riparian Standards and Guidelines. Protect buffers from adjacent harvest activities (e.g., directional felling, split yarding, suspension requirements). (RIP2, BMP 12.6)

F3 Class III/IV Stream Protection: Split yard and directionally fall trees away from Class IV streams without buffers. (RIP2-II)

F4 Yarding Across Streams: Directionally fall and fully suspend logs where yarding is to be done across streams or the full length of a stream or drainage. (RIP2-II)

F6 Use of Bridges: Install bridges at designated stream crossings to minimize the amount of sediment entering streams and/or to ensure good fish passage (TRAN 214-II).

F8 Siting of Road-Stream Crossings: Modify the location of road-stream crossings to correspond with stable stream reaches. (TRAN214-II)

F13 Stormproofing Roads: Design system roads with oversized culverts, outfall riprap, armored dips adjacent to culverts, substantial ditch blocks, drivable waterbars, and/or other measures to prevent culvert failure or erosion during periods of inactivity. (TRAN22-I)

F14 Road Storage: Establish self-maintaining drainages across roads, remove bridges and reestablish natural drainage patterns, and establish vegetation cover on the road to prevent erosion during periods of inactivity. (TRAN22-I)

F15 Avoid Harvesting High Hazard Soils: Modify unit design to avoid very high mass movement areas, including slopes greater than 72 percent. (S&W112-I, BMP 13.5)

F17 Soil/Water Protection along Roads on High Hazard Soils: Where avoidance of road construction along unstable slopes is not possible, take special precautions with fill to prevent soil erosion, stream sedimentation, and mass wasting or require full bench construction and end hauling of excavated material. (S&W112-I, TRAN 214-II, and BMP 14.7)

F18 Suspension Requirements to Protect Soils: Use partial- to full-suspension logging systems in areas with high mass movement potential or McGilvery soils. (S&W112-I, BMP 13.9)

Appendix D

Wildlife and Threatened/Endangered/Sensitive Species

W1 Provide Habitat Diversity by Using the Clearcutting with Reserves System: Provide for greater habitat diversity on a stand level over time by using clearcutting with reserve trees (even-aged system) as a harvest prescription (see Appendix G to Forest Plan FEIS). (WILD112 - III)

W4 Provide Habitat Diversity by Using the Two-aged Harvest System: Provide for greater habitat diversity on a stand level over time by leaving reserve trees (two-aged system) as a harvest prescription (see Appendix G to Forest Plan FEIS). (WILD112 - III)

W6 Provide Habitat Diversity by Using the Uneven-aged Harvest System: Provide for greater habitat diversity on a stand level over time by using the selection method (uneven-aged system) as a harvest prescription (see Appendix G to Forest Plan FEIS). (WILD112 - III)

W8 Restrictions on Helicopter Yarding: Modify helicopter yarding routes and/or timing of helicopter activity to avoid important wildlife habitats (e.g., active raptor nest sites. (WILD112-XII)

W9 Road Closures: Close roads to motorized use to protect wolves and other species from over harvest. (WILD112)

W11 Timing of Activities and Disturbance at Goshawk Nests: If goshawk nests are found, avoid continuous disturbance within 600 feet of the goshawk nest from March 15 to August 15. Apply other forest-wide standards and guidelines. (TE&S-II)

W17 Timing of Activities and Disturbance of Nesting Murrelets: Minimize disturbance activities within high probability nesting habitat between May 1 to June 15. Implement forest-wide standards and guidelines if a nest is found. (WILD112-XII)

W19 Timing of Activities and Disturbance of Waterfowl: Minimize disturbance of waterfowl, by restricting development activities between April 1 and June 15. (WILD112-IX)

W21 Protection of Raptor Nests: Protect active raptor nests (bald eagle, northern goshawk, and osprey are covered by other measures) by providing 600-foot windfirm buffers, where available. (WILD112-X)

W22 Timing of Activities and Disturbance of Raptors during Nesting: Minimize disturbance of raptor nests by restricting development activities between March 1 and June 15. (WILD112-X)

W33 Corridors Between Old-Growth Habitat Reserves: Avoid harvest in order to maintain corridors of old-growth forest between old-growth habitat reserves and other natural-setting LUDs at the landscape scale. (WILD112-XVIII)

Scenery

V1 Meet Visual Resource Objectives by Using the Clearcutting with Reserves System: Reduce visual contrast with adjacent areas by using clearcutting with reserve trees (even-aged system) as a harvest prescription (see Appendix G to Forest Plan FEIS). (VIS11-III)

V4 Meet Visual Resource Objectives by Using a Two-aged Harvest System: Reduce visual contrast with adjacent areas by leaving reserve trees under a two-aged system as a harvest prescription (see Appendix G to Forest Plan FEIS). (VIS11-III)

V6 Meet Visual Resource Objectives by Using the Uneven-aged Harvest System: Reduce visual contrast with adjacent areas by using the selection method (uneven-aged system) as a harvest prescription (see Appendix G to Forest Plan FEIS). (VIS11 - III)

V8 Modification of Unit Boundaries: Modify unit boundaries to ensure that the harvest unit meets the proposed Visual Quality Objective (VQO) in partial retention and retention areas. (VIS11-II)

Other

O1 Minimize Windthrow Hazard: Leave an irregular boundary in wind-prone areas.

O2 Non-productive Soils: Remove areas with non-productive soils from harvest units.

Mitigation Measures by Harvest Unit

Unit	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	F1	F3	F4	F6	F8	F13	F14	F15	F17	F18	W1	W4	W6	W8	W9	W11	W17	W19	W21	W22	W33	V1	V4	V6	V8	O1	O2
1		1				1		1									1			1	1											1
1			1		1	1		1								1				1	1											
1				1		1		1								1*	1*				1											
2		1				1		1				1					1			1												
2			1		1	1		1				1				1				1												
2				1		1		1									1															
3		1				1											1				1											
3			1		1	1										1					1											
3				1		1										1					1											
4		1						1									1				1											
4			1		1			1								1					1											
4				1				1								1					1											
5		1				1						1	1				1			1	1		1								1	
5			1			1						1	1			1				1	1		1								1	
5				1		1							1					1			1		1									
5					1	1						1	1			1	1	1		1			1								1	
6		1				1						1					1			1	1										1	1
6			1			1						1				1				1	1										1	1
6				1		1												1			1											1
6					1	1						1				1		1													1	1
7				1		1												1			1		1			1						
8		1				1						1					1			1						1		1		1	1	
8			1			1						1				1				1						1	1			1	1	
8				1		1												1			1					1			1			
8					1	1						1				1				1	1					1	1			1	1	
9		1				1						1					1			1	1					1		1		1	1	
9			1			1						1				1				1	1					1	1			1	1	
9				1		1												1			1					1			1			
10		1				1		1				1					1			1								1		1	1	
10			1			1		1				1				1				1							1			1	1	
10				1		1		1										1			1								1			
11		1				1											1				1							1		1	1	
11			1			1										1					1						1			1	1	
11				1		1												1			1								1			
12		1		1		1							1				1				1	1										
13		1		1				1					1				1				1	1										
13			1		1			1	1	1		1	1			1					1	1										
14		1		1		1							1				1				1	1										
14			1		1	1				1		1	1			1					1	1										
15		1		1		1		1	1				1				1					1										
15			1		1	1		1	1	1		1	1			1						1										
16		1		1		1											1															1
16			1		1	1						1				1																1
17		1		1		1											1															
17			1		1	1										1																
18		1				1						1	1				1														1	

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Mitigation Measures by Harvest Unit

Unit	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	F1	F3	F4	F6	F8	F13	F14	F15	F17	F18	W1	W4	W6	W8	W9	W11	W17	W19	W21	W22	W33	V1	V4	V6	V8	O1	O2
18			1	1	1	1						1	1			1															1	
19		1				1		1				1					1															
19			1	1	1	1		1				1				1																
20		1				1		1				1					1				1							1		1	1	1
20			1	1	1	1		1				1				1					1						1			1	1	1
21		1				1		1				1					1											1		1	1	1
21			1	1	1	1		1				1				1											1			1	1	1
22		1				1		1			1	1		1			1											1		1		
22			1	1	1	1		1			1	1		1		1											1			1		
23		1				1		1				1					1											1		1		
23			1	1	1	1		1				1				1											1			1		
24		1				1		1				1					1		1					1	1			1		1		
24			1	1	1	1		1				1				1			1					1	1		1			1		
25		1				1		1				1	1	1	1		1		1		1			1	1			1		1	1	
25			1	1	1	1		1				1	1	1	1	1			1		1			1	1		1			1	1	
26		1				1		1									1				1										1	
26			1		1	1		1								1					1										1	
26				1		1		1								1*					1											

* Portion of unit would be clearcut and the remainder would be harvested using a two-aged system.

Note: In addition to the unit-specific measures listed on this table, mitigation measures that apply to all units under all alternatives are listed in the Mitigation section of Chapter 2 of the Final EIS.

Appendix E

Monitoring and Improvement Projects

Appendix E

Monitoring and Improvement Projects

Monitoring Plan

Specific project monitoring is enclosed in this appendix. There may be overlap between monitoring requirements in this plan and in TLMP. Project monitoring for this sale should be designed to answer the questions posed in TLMP Table 6-1, so that wherever possible, monitoring requirements in TLMP can be met by compiling the results of project monitoring.

Forest Plan monitoring is conducted over the entire forest on a sample basis. Samples may be taken within the Skipping Cow Project Area. These results can be used to help answer questions regarding the implementation and effectiveness of mitigation within the Project Area.

The following are specific monitoring projects for this timber sale.

Best Management Practice Implementation

Objective: Evaluate application of Best Management Practices (BMPs) for water quality and fish habitat protection. Stratify selection according to concerns listed below in order to prioritize units with water quality or fisheries concerns.

Method: Follow Tongass National Forest BMP implementation monitoring protocols. Randomly select completed roads and units. Stratify selection according to concerns listed below in order to prioritize units with water quality or fisheries concerns.

Action: The entire project (all harvest units and all roads) will be inspected by sale administrators and road inspectors to ensure compliance with all mitigation measures. Each year, a sample of recently completed Wrangell Ranger District harvest units and roads are randomly selected for monitoring by an interdisciplinary team including watershed or fisheries specialists.

The following roads will be given high priority for monitoring due to the concerns cited:

Road 6594 - fish stream drainage structure replacement (fisheries)
Road 52033 - steep slope
Road 52034 - steep slope

The following harvest units will be given a high priority for monitoring due to the concerns cited:

Unit 5 - fisheries, stream buffers, windthrow
Unit 6 - fisheries, stream buffers, windthrow
Unit 7 - fisheries, stream buffers, windthrow
Unit 8 - stream buffers, windthrow
Unit 9 - fisheries, stream buffers, windthrow
Unit 10 - stream buffers, windthrow
Unit 11 - stream buffers, windthrow
Unit 12 - stream buffers, steep slopes
Unit 18 - fisheries, stream buffers, windthrow
Unit 23 - stream buffers, temporary road location
Unit 24 - stream buffers, temporary road location
Unit 25 - stream buffers, windthrow
Unit 26 - yarding across Vial Creek fishery

If protection is inadequate, apply corrective measures. If protection measures are inadequate or unsuitable, modify future recommendations.

Cost: $1,000

Best Management Practice Effectiveness

Objective: Address priorities indicated in Tongass National Forest effectiveness monitoring strategy. Monitoring sites may or may not be selected within the Skipping Cow Project Area.

Action: Units in high windthrow risk areas (Units 5 through 11, 18 through 21, 25, and 26) will be included in the Tongass National Forest buffer stability monitoring (monitoring plan currently under revision). This is being done on a forest-wide basis and monitoring of this type on Zarembo Island would be an element of the overall effort. Buffer stability monitoring involves pre- and post-harvest aerial reconnaissance to monitor windthrow in buffers. Individual buffers associated with these units will be considered for Tongass National Forest buffer effectiveness monitoring (monitoring plan currently under revision).

Buffer effectiveness monitoring involves pre- and post-harvest instream measurements within the buffer. If protection is inadequate, modify BMP.

Regeneration

Objective: To determine if there is adequate natural stocking within each unit four years after harvest.

Method: Field exams of each unit.

Action: If adequate stocking is not present in any harvest unit, it will be planted to bring stocking up to at least 300 trees per acre.

Cost: $14,000 to $30,000 depending on the alternative selected.

Blowdown on Nesbitt Ridge

Objective: To determine if there is any blowdown within reserve clumps, partial harvest units, and unit edges. To determine if timber sale prescriptions met the resource objectives after harvest.

Method: Aerial flights and ground reconnaissance.

Action: Use the results to refine future prescriptions.

Cost: $2,000

Road Closure Effectiveness

Objective: If Option B is selected to close new roads constructed within the project area, determine if gates are effective in eliminating motorized vehicle traffic and to determine the extent of administrative use and foot travel occurring on the roads during various seasons. This will give us an idea of the amount of disturbance and hunting that is occurring in the Project Area.

Method: Traffic counters (pressure activated and/or motion detection), track plates or cameras will be used.

Action: If unauthorized vehicle use occurs, additional barriers may be installed. Gates that are damaged or not functioning will be replaced or improved.

Cost: $1,000 per year

Road Maintenance

Objective: To inspect roads for maintenance needs.

Method: A maintenance crew will inspect the road system annually to ensure that the road is not causing resource damage.

Action: The crew will perform hand work such as culvert cleaning and seeding as necessary. If other maintenance needs are identified (requiring heavy equipment), maintenance projects will be planned as necessary.

Cost: Estimated at $1,000 per year

Raptor Nests

Objective: To determine if protection measures are adequate to promote continued use of raptor nests.

Method: The sharp-shinned hawk nest found in the Vial drainage will be visited annually for not less than two years following harvest to determine if the nest remains active.

Action: If the nest is inactive for two years, protection measures may be removed; however, the size of the buffer for nests located in the future may need to be increased to promote continued use of the nest.

Cost: Estimated at $300 per year

Marbled Murrelet Habitat Use

Objective: To determine if timing restrictions and retention were effective in maintaining murrelet use of Upper Middle Meter Bight.

Method: Conduct annual early morning surveys using protocol used for pre-sale surveys.

Action: Refine future prescriptions, if needed.

Cost: $1,000 annually

Corridor Effectiveness

Objective: To determine if designated corridor through sale area and along beach fringe are being used for dispersal of small mammals. The value of the beach fringe would be compared to the interior corridor to assist in future sale planning in this area.

Method: Sample each corridor for 500 trap nights at 5 year intervals.

Action: Refine corridor design/location in future sales, if necessary.

Cost: $1,000 every 5 years

Fish Management Indicator Species (MIS) for Forest Plan Monitoring

Objective: Monitor trends in population and habitat for fish MIS. Sites in Vial or Middle Meter Bight Creek may be suitable.

Method: If sites within the project area are selected as representative of the forest, data collection will proceed according to forest-wide protocols.

Action: No action anticipated for the Skipping Cow project. Results will be used to determine trends and may be applied to adapting future projects.

Cost: If sites within the project area are selected, monitoring will be funded as a portion of the Tongass-wide monitoring plan. Each site costs approximately $2,000 per year to monitor.

Fish Passage Through Drainage Structures

Objective: To determine if road-stream crossings create migratory barriers.

Method: Road condition survey data at fish stream crossings will be collected (or updated) according to protocols described in FSH 7709.58. Upstream assessments will follow if survey data indicates a potential for migratory barrier.

Action: If site assessment indicates failure to pass fish, drainage structure replacement will be planned as appropriate.

Cost: Cost of data collection and assessment is estimated at about $100 per site.

Potential Improvement Projects

The projects listed below may be implemented within the Skipping Cow Project Area. The most common method of funding these projects is by using KV. Other funding may be obtained for accomplishing these projects if they do not meet the requirements for using KV funding. All projects utilizing KV funds will comply with Forest Service KV handbook direction (FSH 2409.19). KV funding will be obtained from timber sale revenues generated by this sale for regeneration surveys and tree planting. The following projects are not necessarily listed in order of funding priority.

Natural Regeneration Surveys

These surveys will be done on each harvest unit to determine if the units are stocked within 5 years after harvest. This is done to meet NFMA requirements.

Tree Planting

Harvest units that are not adequately stocked within 5 years after harvest will be planted to increase stocking. Units may also be planted to increase the species diversity of yellow-cedar, western red cedar, and Sitka spruce.

Precommercial Thinning

Units harvested in previous timber sales that fall within the project area of this timber sale may be precommercially thinned to reduce stocking and increase for production for wildlife.

Appendix F

Road Cost Analysis Documentation

Appendix F
Cost Analysis Documentation

The spreadsheets in this appendix present the cost analysis used to compare road management options for each alternative. The values, presented in 1998 dollars, were calculated using a present value analysis employing the standard Forest Service discount rate of 4 percent. The spreadsheets consist of the following:

- A summary sheet consisting of four tables that summarize the total discounted cost for Options A and B for each alternative and each affected road.
- Two spreadsheets for each alternative. The first spreadsheet for each alternative summarizes the assumptions for each road and the associated costs by option. The second spreadsheet for each alternative provides a summary of the discount rate calculations by option and road.

Road Management Comparison for Alternative 2			
Road	Option A	Option B	
6594 (mp 6.36 - 7.47)	23,469	16,383	
6594 (mp 7.47 - 8.73)	26,640	38,910	
52032	38,480	56,204	
52033	113,961	169,336	
Total Cost	202,550	280,834	
Note: Costs are expressed in 1998 dollars using a 4% discount rate.			
Road Management Comparison for Alternative 3			
Road	Option A	Option B	
6594 (mp 6.36 - 7.47)	23,469	16,383	
6594 (mp 7.47 - 8.73)	26,640	38,910	
52032	38,480	56,204	
52033	113,961	169,336	
52034	46,515	67,939	
Total Cost	249,065	348,772	
Note: see Table 3.1			
Road Management Cost Comparison for Alternative 4			
Road	Option A	Option B	
6594 (mp 6.36 - 7.47)	23,469	16,383	
6594 (mp 7.47 - 8.73)	26,640	38,910	
52032	38,480	56,204	
Total Cost	88,589	111,498	
Note: see Table 3.1			
Road Management Cost Comparison for Alternative 5			
Road	Option A	Option B	
6594 (mp 6.36 - 7.47)	23,469	16,383	
6594 (mp 7.47 - 8.73)	26,640	38,910	
52032	38,480	56,204	
52033	90,703	135,367	
52034	46,515	67,939	
Total Cost	225,807	314,803	
Note: see Table 3.1			

		ALTERNATIVE 2			
		Option A			
Road	Length	Action	Cost/Mile	Total Cost	Time Period
6594	1.11	stormproof	5,000	5,550	1
(MP 6.36 - 7.47)		maintain open	1,000	1,110	annual
6594	1.26	stormproof	5,000	6,300	1
(MP 7.47 - 8.73)		maintain open	1,000	1,260	annual
52032	1.82	stormproof	5,000	9,100	1
		maintain open	1,000	1,820	annual
52033	5.39	stormproof	5,000	26,950	1
		maintain open	1,000	5,390	annual
Total Road Miles	9.58				
		Option B			
Road	Length	Action	Cost/Mile	Total Cost	Time Period
6594	1.11	stormproof	5,000	5,550	1
(MP 6.36 - 7.47)		install gate*	3,000	3,000	1
		maintenance	450	500	annual
6594	1.26	storage	15,000	18,900	1
(MP 7.47 - 8.73)		maintenance	450	567	annual
		reopen	30,000	37,800	30
52032	1.82	storage	15,000	27,300	1
		maintenance	450	819	annual
		reopen	30,000	54,600	30
52033	5.39	storage	15,000	80,850	1
		install gate	3,000	3,000	1
		maintenance	450	2,426	annual
		reopen	30,000	161,700	30
Total Road Miles	9.58				
*Cost per gate	$3,000				

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		ALTERNATIVE 2			
Road:	**6594**	**Milepost:**	**6.36-7.47**		
	Option A	Option B		Option A	Option B
Year	Costs 1998 Dollars	Costs 1998 Dollars	4% Discount Rate	Discounted Costs	Discounted Costs
1	5,550	8,550	0.962	5,339.10	8,225.10
2 to 29	1,110	500	16.025	17,787.75	8,004.49
30	1,110	500	0.308	341.88	153.85
Total				23,469	16,383
Road:	**6594**	**Milepost:**	**7.47-8.73**		
	Option A	Option B		Option A	Option B
Year	Costs 1998 Dollars	Costs 1998 Dollars	4% Discount Rate	Discounted Costs	Discounted Costs
1	6,300	18,900	0.962	6,060.60	18,181.80
2 to 29	1,260	567	16.025	20,191.50	9,086.18
30	1,260	37,800	0.308	388.08	11,642.40
Total				26,640	38,910
Road:	**52032**				
	Option A	Option B		Option A	Option B
Year	Costs 1998 Dollars	Costs 1998 Dollars	4% Discount Rate	Discounted Costs	Discounted Costs
1	9,100	27,300	0.962	8,754.20	26,262.60
2 to 29	1,820	819	16.025	29,165.50	13,124.48
30	1,820	54,600	0.308	560.56	16,816.80
Total				38,480	56,204
Road:	**52033**				
	Option A	Option B		Option A	Option B
Year	Costs 1998 Dollars	Costs 1998 Dollars	4% Discount Rate	Discounted Costs	Discounted Costs
1	26,950	83,850	0.962	25,925.90	80,663.70
2 to 29	5,390	2,426	16.025	86,374.75	38,868.64
30	5,390	161,700	0.308	1,660.12	49,803.60
Total				113,961	169,336

		ALTERNATIVE 3			
		Option A			
Road	Length	Action	Cost/Mile	Total Cost	Time Period
6594	1.11	stormproof	5,000	5,550	1
(MP 6.36 - 7.47)		maintain open	1,000	1,110	annual
6594	1.26	stormproof	5,000	6,300	1
(MP 7.47 - 8.73)		maintain open	1,000	1,260	annual
52032	1.82	stormproof	5,000	9,100	1
		maintain open	1,000	1,820	annual
52033	5.39	stormproof	5,000	26,950	1
		maintain open	1,000	5,390	annual
52034	2.2	stormproof	5,000	11,000	1
		maintain open	1,000	2,200	annual
Total Road Miles	11.78				
		Option B			
Road	Length	Action	Cost/Mile	Total Cost	Time Period
6594	1.11	stormproof	5,000	5,550	1
(MP 6.36 - 7.47)		install gate	3,000	3,000	1
		maintenance	450	500	annual
6594	1.26	storage	15,000	18,900	1
(MP 7.47 - 8.73)		maintenance	450	567	annual
		reopen	30,000	37,800	30
52032	1.82	storage	15,000	27,300	1
		maintenance	450	819	annual
		reopen	30,000	54,600	30
52033	5.39	storage	15,000	80,850	1
		install gate	3,000	3,000	1
		maintenance	450	2,426	annual
		reopen	30,000	161,700	30
52034	2.2	storage	15,000	33,000	1
		maintenance	450	990	annual
		reopen	30,000	66,000	30
Total Road Miles	11.78				

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		ALTERNATIVE 3			
Road:	**6594**	**Milepost:**	**6.36-7.47**		
	Option A	Option B		Option A	Option B
Year	Costs 1998 Dollars	Costs 1998 Dollars	4% Discount Rate	Discounted Costs	Discounted Costs
1	5,550	8,550	0.962	5,339.10	8,225.10
2 to 29	1,110	500	16.025	17,787.75	8,004.49
30	1,110	500	0.308	341.88	153.85
Total				23,469	16,383
Road:	**6594**	**Milepost:**	**7.47-8.73**		
	Option A	Option B		Option A	Option B
Year	Costs 1998 Dollars	Costs 1998 Dollars	4% Discount Rate	Discounted Costs	Discounted Costs
1	6,300	18,900	0.962	6,060.60	18,181.80
2 to 29	1,260	567	16.025	20,191.50	9,086.18
30	1,260	37,800	0.308	388.08	11,642.40
Total				26,640	38,910
Road:	**52032**				
	Option A	Option B		Option A	Option B
Year	Costs 1998 Dollars	Costs 1998 Dollars	4% Discount Rate	Discounted Costs	Discounted Costs
1	9,100	27,300	0.962	8,754.20	26,262.60
2 to 29	1,820	819	16.025	29,165.50	13,124.48
30	1,820	54,600	0.308	560.56	16,816.80
Total				38,480	56,204
Road:	**52033**				
	Option A	Option B		Option A	Option B
Year	Costs 1998 Dollars	Costs 1998 Dollars	4% Discount Rate	Discounted Costs	Discounted Costs
1	26,950	83,850	0.962	25,925.90	80,663.70
2 to 29	5,390	2,426	16.025	86,374.75	38,868.64
30	5,390	161,700	0.308	1,660.12	49,803.60
Total				113,961	169,336
Road:	**52034**				
	Option A	Option B		Option A	Option B
Year	Costs 1998 Dollars	Costs 1998 Dollars	4% Discount Rate	Discounted Costs	Discounted Costs
1	11,000	33,000	0.962	10,582.00	31,746.00
2 to 29	2,200	990	16.025	35,255.00	15,864.75
30	2,200	66,000	0.308	677.60	20,328.00
Total				46,515	67,939

		ALTERNATIVE 4			
		Option A			
Road	Length	Action	Cost/Mile	Total Cost	Time Period
6594	1.11	stormproof	5,000	5,550	1
(MP 6.36 - 7.47)		maintain open	1,000	1,110	annual
6594	1.26	stormproof	5,000	6,300	1
(MP 7.47 - 8.73)		maintain open	1,000	1,260	annual
52032	1.82	stormproof	5,000	9,100	1
		maintain open	1,000	1,820	annual
Total Road Miles	4.19				
		Option B			
Road	Length	Action	Cost/Mile	Total Cost	Time Period
6594	1.11	stormproof	5,000	5,550	1
(MP 6.36 - 7.47)		install gate	3,000	3,000	1
		maintenance	450	500	annual
6594	1.26	storage	15,000	18,900	1
(MP 7.47 - 8.73)		maintenance	450	567	annual
		reopen	30,000	37,800	30
52032	1.82	storage	15,000	27,300	1
		maintenance	450	819	annual
		reopen	30,000	54,600	30
Total Road Miles	4.19				

		ALTERNATIVE 4			
Road:	**6594**	**Milepost:**	**6.36-7.47**		
	Option A	Option B		Option A	Option B
Year	Costs 1998 Dollars	Costs 1998 Dollars	4% Discount Rate	Discounted Costs	Discounted Costs
1	5,550	8,550	0.962	5,339.10	8,225.10
2 to 29	1,110	500	16.025	17,787.75	8,004.49
30	1,110	500	0.308	341.88	153.85
Total				23,469	16,383
Road:	**6594**	**Milepost:**	**7.47-8.73**		
	Option A	Option B		Option A	Option B
Year	Costs 1998 Dollars	Costs 1998 Dollars	4% Discount Rate	Discounted Costs	Discounted Costs
1	6,300	18,900	0.962	6,060.60	18,181.80
2 to 29	1,260	567	16.025	20,191.50	9,086.18
30	1,260	37,800	0.308	388.08	11,642.40
Total				26,640	38,910
Road:	**52032**				
	Option A	Option B		Option A	Option B
Year	Costs 1998 Dollars	Costs 1998 Dollars	4% Discount Rate	Discounted Costs	Discounted Costs
1	9,100	27,300	0.962	8,754.20	26,262.60
2 to 29	1,820	819	16.025	29,165.50	13,124.48
30	1,820	54,600	0.308	560.56	16,816.80
Total				38,480	56,204

		ALTERNATIVE 5			
		Option A			
Road	Length	Action	Cost/Mile	Total Cost	Time Period
6594	1.11	stormproof	5,000	5,550	1
(MP 6.36 - 7.47)		maintain open	1,000	1,110	annual
6594	1.26	stormproof	5,000	6,300	1
(MP 7.47 - 8.73)		maintain open	1,000	1,260	annual
52032	1.82	stormproof	5,000	9,100	1
		maintain open	1,000	1,820	annual
52033	4.29	stormproof	5,000	21,450	1
		maintain open	1,000	4,290	annual
52034	2.2	stormproof	5,000	11,000	1
		maintain open	1,000	2,200	annual
Total Road Miles	10.68				
		Option B			
Road	Length	Action	Cost/Mile	Total Cost	Time Period
6594	1.11	stormproof	5,000	5,550	1
(MP 6.36 - 7.47)		install gate	3,000	3,000	1
		maintenance	450	500	annual
6594	1.26	storage	15,000	18,900	1
(MP 7.47 - 8.73)		maintenance	450	567	annual
		reopen	30,000	37,800	30
52032	1.82	storage	15,000	27,300	1
		maintenance	450	819	annual
		reopen	30,000	54,600	30
52033	4.29	storage	15,000	64,350	1
		install gate	3,000	3,000	1
		maintenance	450	1,931	annual
		reopen	30,000	128,700	30
52034	2.2	storage	15,000	33,000	1
		maintenance	450	990	annual
		reopen	30,000	66,000	30
Total Road Miles	10.68				

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		ALTERNATIVE 5			
Road:	**6594**	**Milepost:**	**6.36-7.47**		
	Option A	Option B		Option A	Option B
Year	Costs 1998 Dollars	Costs 1998 Dollars	4% Discount Rate	Discounted Costs	Discounted Costs
1	5,550	8,550	0.962	5,339.10	8,225.10
2 to 29	1,110	500	16.025	17,787.75	8,004.49
30	1,110	500	0.308	341.88	153.85
Total				23,469	16,383
Road:	**6594**	**Milepost:**	**7.47-8.73**		
	Option A	Option B		Option A	Option B
Year	Costs 1998 Dollars	Costs 1998 Dollars	4% Discount Rate	Discounted Costs	Discounted Costs
1	6,300	18,900	0.962	6,060.60	18,181.80
2 to 29	1,260	567	16.025	20,191.50	9,086.18
30	1,260	37,800	0.308	388.08	11,642.40
Total				26,640	38,910
Road:	**52032**				
	Option A	Option B		Option A	Option B
Year	Costs 1998 Dollars	Costs 1998 Dollars	4% Discount Rate	Discounted Costs	Discounted Costs
1	9,100	27,300	0.962	8,754.20	26,262.60
2 to 29	1,820	819	16.025	29,165.50	13,124.48
30	1,820	54,600	0.308	560.56	16,816.80
Total				38,480	56,204
Road:	**52033**				
	Option A	Option B		Option A	Option B
Year	Costs 1998 Dollars	Costs 1998 Dollars	4% Discount Rate	Discounted Costs	Discounted Costs
1	21,450	67,350	0.962	20,634.90	64,790.70
2 to 29	4,290	1,931	16.025	68,747.25	30,936.26
30	4,290	128,700	0.308	1,321.32	39,639.60
Total				90,703	135,367
Road:	**52034**				
	Option A	Option B		Option A	Option B
Year	Costs 1998 Dollars	Costs 1998 Dollars	4% Discount Rate	Discounted Costs	Discounted Costs
1	11,000	33,000	0.962	10,582.00	31,746.00
2 to 29	2,200	990	16.025	35,255.00	15,864.75
30	2,200	66,000	0.308	677.60	20,328.00
Total				46,515	67,939

Appendix G

Response to Public Comments on Skipping Cow Draft EIS

Response to Public Comments on the Skipping Cow Draft EIS

Introduction

Appendix G includes all written and oral comments received for the Skipping Cow Draft Environmental Impact Statement (DEIS) and the Forest Service's response to the issues addressed in the public comments. The Forest Service received 16 written comments in addition to oral comments received at the ANILCA hearing (see below). The Interdisciplinary team thoroughly and objectively read and analyzed every substantive issue and concern. Individual comments/issues within each letter were numbered to facilitate analysis and response.

The Forest Service responses discuss how the issue has been addressed in the EIS, provide an overview of Forest Service policy or direction regarding the issue, and/or direct the reader to the appropriate section of the Forest Plan for a more complete discussion.

Letters Received from Individuals, Organizations, and Agencies

The following list includes all individuals, organizations, and agencies that the Forest Service received comments from during the 45-day comment period for the Skipping Cow Draft EIS:

Letter	First Name	Last Name	City	State	Organization	Pages
1	Jennifer R.	Garland	Juneau	AK	Alaska Division of Government Coordination	G-2 – G-20
2	Richard B.	Parkin	Seattle	WA	Environmental Protection Agency	G-21 – G-22
3	Ralph W.	Thompson	Juneau	AK	Dept. of the Army, Corps of Engineers	G-23 – G-26
4	Steven	Pennoyer	Juneau	AK	National Marine Fisheries Service	G-27 – G-28
5	John	Lindell	Juneau	AK	US Fish and Wildlife Service	G-29 – G-30
6	Pamela	Bergmann	Anchorage	AK	US Fish and Wildlife Service	G-31 – G-40
7	Lori	Morgan	Redding	CA		G-41 – G-42
8	Billie	Smith	Dallas	TX		G-43 – G-46
9	Jack E.	Phelps	Ketchikan	AK	Alaska Forest Association	G-47 – G-54
10	Gabriel	Scott	Fairbanks	AK	Cascade Wildlands Project	G-55 – G-62
11	Bryan	Bird	Santa Fe	NM	Forest Conservation Council	G-63 – G-66
12	Nathaniel	Lawrence	Olympia	WA	National Resources Defense Council	G-67 – G-71
13	Marc	Wheeler	Juneau	AK	Southeast Alaska Conservation Council	G-73 – G-84
14	James A.	Stough	Wrangell	AK[1/]		G-85 – G-88
15	Greg	Miller	Wrangell	AK[1/]		G-85 – G-88
16	Bruce	Jamieson	Wrangell	AK[1/]		G-86 – G-88

1/ Testified at subsistence hearing

STATE OF ALASKA

OFFICE OF THE GOVERNOR

TONY KNOWLES, GOVERNOR

OFFICE OF MANAGEMENT AND BUDGET
DIVISION OF GOVERNMENTAL COORDINATION

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ANCHORAGE, ALASKA 99501-2343
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RECEIVED
SEP 23 1999
FOREST SERVICE

September 17, 1999

Mr. Jerry Jordan, IDT Leader
U.S. Forest Service, Wrangell Ranger District
P.O. Box 51
Wrangell, AK 99929

Dear Mr. Jordan:

SUBJECT: SKIPPING COW TIMBER SALE
State ID No. AK 9908-02JJ
PROPOSED CONSISTENCY FINDING

The Division of Governmental Coordination (DGC) has coordinated the State's review of the U.S. Forest Service's consistency determination for the Skipping Cow Timber Sale. The FS found the activity consistent, to the maximum extent practicable, with the Alaska Coastal Management Program (ACMP). The location of the sale is the south half of Zarembo Island, 10 miles west of Wrangell, Alaska. It encompasses an area of approximately 25, 740 acres, including the Nesbitt Creek and Vial Creek watersheds, and the upper portions of the North and Middle Meter Bight Creek watersheds. Portions of VCUs 457, 458, and 459 are included in the planning area.

The FS has identified Alternative 5 as the Preferred Alternative. This alternative proposes harvest of approximately 20.1 MMBF of timber from approximately 906 acres. Approximately 10.4 miles of specified roads and 3.9 miles of temporary roads would be constructed.

This proposed consistency finding, developed under 6 AAC 50, applies to the federal consistency determination required for the project per 15 CFR 930 Subpart C. The State reviewed the proposed timber harvest activity to determine if state coastal resource concerns are adequately addressed and to determine if the State agrees that the activity is consistent, to the maximum extent practicable, with the enforceable policies of the ACMP. The State cannot concur with the FS determination of consistency at this time, however, the State is prepared to ADGC-1

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concur with the FS determination subsequent to the resolution (State-Forest Service) of the items outlined in the following comments, offered pursuant to 6 AAC 50 of the ACMP. ACMP (FPRA) standards are cited where applicable. NEPA and NFMA comments are attached as an Appendix. **ADGC-1 cont.**

CONSISTENCY FINDING

Road Access Management:

The Forest Service is considering two post-harvest Road Access Management scenarios for this project. According to the DEIS (page S-5) "Under Option A, all new system roads would remain open for public use. Under Option B, in all action alternatives, all new roads and approximately 1 mile of existing road would be closed to public access." The State concurs with the Forest Service's preference to implement Road Access Management Option B. Although the maintenance and closure methods that are proposed under both Options A and B appear to be consistent with the standards of **11 AAC 95.315(c)** and **11 AAC 95.320** for inactive and closed roads, Option B would best ensure the maintenance of water quality and fish habitat by effectively closing most new roads in the Project Area. **ADGC-2**

Units of Concern for Blowdown of Class III Process Group Buffers:

Although wind disturbance is discussed at length throughout the DEIS, the clearcuts that are prescribed for many of the units under Alternatives 3, 4, and 5 raise significant concerns regarding the high potential for blowdown of the Class III process group buffers within and adjacent to the units. Such blowdown can result in substantial and chronic (over several years) sediment delivery to downstream fish habitat from upturned rootwads and destabilized sideslopes. Specifically, the following units, which are all mapped in the high windthrow risk areas depicted in Figure 3-10, either contain or have Class III stream buffers along their northern boundaries that would be highly susceptible to blowdown following the adjacent clearcut harvesting on their windward sides: **ADGC-3**

Unit 8: The small northern portion of this unit is separated from the main portion by the process group buffer on a Class III HC6 channel that flows through the unit. Given the high windthrow risk in this area, it may not be appropriate to create this small clearcut opening on the north (lee) side of this stream.

Unit 9: A Class III HC6 channel occurs along the entire length of the northern unit boundary. This stream transitions to Class I habitat just downstream of the northeastern corner of the unit and is directly tributary to the Class I FP3 channel of Nesbitt Creek.

Unit 10: Two Class III HC channels occur within this unit, one of which also forms the northern boundary of the unit. Both flow east/southeast and are directly tributary to the Class I mainstem of Nesbitt Creek.

Unit 11: A Class III HC5 channel occurs along the northernmost portion of this unit and is also directly tributary to the Class I mainstem of Nesbitt Creek. ADGC-3 cont.

Unit 18: A Class III HC5 channel forms the northeastern boundary of this unit and is directly tributary to the Class II habitat of Middle Meter Bight Creek located a short distance downstream.

Unit 26: A Class III HC6 / Class II HC1 channel forms the northern boundary of the unit and is directly tributary to Vial Creek. According to the silvicultural prescriptions for Alternatives 3 and 5, this unit is prescribed for clearcutting and, although the alternative map and the unit card map for Alternative 4 also show this portion of the unit as being prescribed for clearcutting, the silvicultural prescription narrative on the unit card for Alternative 4 indicates that the northern portion of the unit will be harvested using a two-aged system, and the southern portion will be clearcut. This needs to be corrected for the FEIS. ADGC-4

Although the mitigation narratives on the unit cards for these units state "Provide a reasonable assurance of a windfirm buffer," given the stated high windthrow concern and the orientation of these streams to the prevailing storm winds, it is doubtful that reasonable assurance of windfirmness can be obtained following the adjacent clearcut harvesting. Measures that will be taken to minimize the potential for blowdown are not provided, but we believe that the buffers on these streams should be expanded on the windward side to at least a minimum distance of one site-potential tree beyond the slope break and, within this expanded area, selectively harvested to remove the most windthrow-prone trees. Doing so should effectively mitigate the concern for windthrow and would ensure consistency with AS 41.17.060(b)(5) and (c)(5) which state, respectively, **"significant adverse effects of soil erosion and mass wasting on water quality and fish habitat shall be prevented or minimized,"** and **"there may not be significant impairment of the productivity of the land and water with respect to renewable resources."** It would also be consistent with the process group management direction of Riparian Standard and Guideline RIP2.III.E for providing reasonable assurance of windfirmness. ADGC-5

Units With Questionable Yarding Feasibility:

As depicted on the unit card maps, the following units contain areas that are either isolated and not connected to any roads, or are inaccessible to the proposed cable yarding due to the presence of buffered Class III streams. Consequently, until the unit cards are revised to reflect what is actually proposed for these units, we cannot determine how they will be yarded and whether the yarding will be accomplished consistent with the standards of 11 AAC 95.345(b)(1) and 11 AAC 95.360(a)-(c): ADGC-6

Unit 6: The northwest portion of this unit is separated from the main body of the unit by a buffered Class III HC6 channel. However, no indication is provided as to how this isolated portion of the unit will be yarded. We can only assume that full suspension above and across the buffered stream is prescribed to retrieve the logs from

this area; however, given the topographic features as depicted on the unit card map, it does not appear that full suspension would be feasible in this setting.

Unit 19: As depicted on the unit card map, an isolated portion of this unit occurs on the west side of the buffered Class III stream that forms the western unit boundary. Given that no roads are shown as accessing this small area, it is difficult to understand how it will be yarded without hauling logs across the stream and through the process group buffer, especially since it appears that full suspension over the buffer is not feasible. Consequently, unless full suspension can be assured, this small area should simply be deleted from the unit altogether. In addition, the unit card map displays a buffered Class III FP3 channel as occurring along the northeastern boundary of the unit, however, no mention of this stream is made in the Watershed/Fisheries narrative on the unit card. While it appears that this stream is designated to receive the appropriate 130-foot FP3 process group buffer, the riparian protection prescription should be described in the narrative to ensure that it is implemented on the ground. **ADGC-6 cont.**

Unit 21: As with Units 6 and 19, this unit is separated into two portions by a buffered Class III stream, thereby isolating the small southeast portion from the main body of the unit on the west side of the stream. Consequently, we are unable to determine how this area will be yarded without affecting the process group buffer and its adjacent windfirm management area.

Unit 24: As depicted on the unit card map, a portion of this unit appears to be inaccessible to the running skyline and, especially, the highlead cable yarding systems that are prescribed under the various alternatives. Specifically, that portion east of the southernmost Class III stream in the unit would be blocked to cable yarding by the process group buffer on the stream.

If full suspension over these buffered Class III streams is what actually is being proposed for these units, there was no indication of this on the unit cards. In fact, with the exception of the full suspension that is prescribed over Vial Creek adjacent to Unit 26, no suspension objectives or requirements were included on any of the unit cards. This information must be included on the FEIS unit cards to ensure that BMP 13.9 will be implemented during project planning and timber sale administration.

Deer Habitat:

The Tongass Fish and Wildlife Resource Assessment, 1998" prepared by ADF&G, identified VCU 458, which includes the Nesbitt ridge, as an area with the highest sensitivity to disturbance of subsistence use areas. Zarembo Island is an important deer hunting area for the communities of Wrangell and Petersburg. Construction of the road along the top of the Nesbitt ridge reduces the effectiveness of the travel corridor and increases access to critical deer habitat in both the Nesbitt ridge and the upper Snow Pass Old Growth Reserve. Protection of critical deer winter habitat is required in order to ensure consistency with **AS 41.17.060(c)(3)** and **(c)(7)**. **ADGC-7**

Skipping Cow Timber Sale Page 5 09/17/99

Elevation. You must respond by 5:00pm on the fifth calendar day following your receipt of this proposed finding to indicate whether you concur with this finding. If you, the federal agency, are not prepared to concur within the five-day period, you may either:

(1) request an extension of the review schedule pursuant to 6 AAC 50.110(b)(8) if you need more time to consider this finding; or

(2) request that the State review this finding, by submitting a written statement requesting "elevation" of the finding, describing your concerns, and proposing an alternative consistency finding. This alternative finding must demonstrate how your project is consistent with the referenced standards of the ACMP and district policies. **ADGC-8**

Other review participants with elevation rights pursuant to 6 AAC 50.075(a) may also request an elevation if they submit the information required in (b) above to DGC by 5:00pm on the fifth calendar day following receipt of the proposed finding.

If DGC does not receive a request for extension or an elevation statement from you, or any other review participant with elevation rights, this proposed consistency finding will be issued as a final consistency finding.

Please be advised that although the State agrees the project is consistent with the ACMP, based on your project description and any alternative measures contained herein, you are still required to meet all applicable State and federal laws and regulations. Your consistency finding may include reference to specific laws and regulations, but this in no way precludes your responsibility to comply with other applicable laws and regulations.

If changes to the approved project are proposed prior to or during its siting, construction, or operation, you are required to contact this office immediately to determine if further review and approval of the revised project is necessary. If the actual use differs from the approved use contained in the project description, the State may amend this consistency finding. **ADGC-9**

Should cultural or paleontological resources be discovered as a result of this activity, we request that work which would disturb such resources be stopped, and that the State Historic Preservation Office be contacted immediately (269-8720).

If you have any questions regarding this process, please contact me at 465-3177 or email Jennifer_Garland@gov.state.ak.us.

Sincerely,

Jennifer R. Garland

Jennifer R. Garland
Project Review Coordinator

Cc:
** Kevin Hanley, DEC, Juneau
** Jim Cariello, DFG, Petersburg
** Bill Hanson, DFG, Juneau
** Tom Paul, DFG/DWC, Juneau
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Appendix

NEPA/NFMA COMMENTS

Desired Future Conditions (page 9)
The DEIS states "Biologically important habitats will continue to be represented in the Project Area, so that a full spectrum of wildlife habitat needs is accounted for and landscape biodiversity is maintained." Figure 3-13, Acreage Classification for the Skipping Cow Project Area (page 188), shows that of 10,503 acres of Productive Forest Land in the Project Area, 7,879 acres is suitable for timber harvest and the remaining 2,624 acres is in beach and riparian buffers and high hazard soils. Following future entries in the project area, there will be very little critical winter habitat remaining for deer, such that it is unclear how a full spectrum of wildlife habitat needs can be maintained over the long term in the project area. **ADGC-10**

Items Common to All Alternatives (page 22)
Retaining 5 trees over 30" DBH per acre does not "protect" marble murrelet habitat, and is of little benefit for marble murrelets. TLMP S&G, page 4-117 states: "Nesting habitat relationships are poorly understood" and recommends "a 600 foot, generally circular, radius of undisturbed forest habitat surrounding identified murrelet nests, where available." **ADGC-11**

Alternative 2 (page 23)
Alternative 2 was designed to respond to the issue of protecting wildlife by reducing the amount of clearcutting, retaining 20-30 percent of the trees greater than 9 inches in diameter. However, in the Vegetation and Timber Resources Section on page 195, the DEIS states: "On sites exposed to strong windstorms, many of the large trees would likely blow over, resulting in a less uniform two-aged stand that develops after partial blowdown. On protected sites, where the large trees would persist, stands are expected to trend toward a multi-aged condition." Twelve of the units are in areas where large-scale blowdown predominates, Figure 3-10, and total 759, acres or 67% of the acreage, in this alternative. We seriously question how this alternative will benefit wildlife, especially deer. **ADGC-12**

Alternative 3 (page 24)
Alternative 3 maximizes the amount of clearcutting and cable yarding to respond to the issue of timber economics with the resulting stands managed as even-aged stands. All units are cable yarded with approximately 10% of the trees over 9 inches DBH left within the unit. Appendix G, Silvicultural Systems, of TLMP (pageG-1) states: "No single silvicultural system can produce all desired combinations of products and amenities from a particular stand, or from a National Forest. A good silvicultural system is a solution to a specific set of circumstances; and it should fit logically into the overall management plan for the forest." **ADGC-13**

Both alternatives 2 & 3 do little to limit harvest-enduced windthrow, which was identified on page 9 as a part of the desired future condition. Nesbitt Ridge has been identified as a wind prone area, yet in Alternatives 2 & 3, the size of the units in this area are over 40 acres with many close to 100 acres in size. This unit design contradicts a recent FS publication Science Matters: Information for Managing the Tongass National Forest, which recommends reducing the average size of clearcut units to emulate natural patterns of wind disturbance, which average less than 40

acres each. In addition, the shape and location of unit boundaries along Class III streams will create abrupt edges and exacerbate the potential for increased sedimentation in the watersheds. **ADGC-13 cont.**

Alternative 4 (page 25)
This alternative would best mimic the historical windthrow patterns present on Nesbitt ridge through uneven-aged harvest and small openings, which would minimize harvest-enduced windthrow. In addition, we feel this alternative provides the most protection of critical deer winter habitat on Nesbitt ridge through limiting harvest to 25% removal by helicopter and by not providing road access to the area. However, we still have concerns with the size of unit 18(100 acres) and unit 25(92 acres) which are in areas where with high wind exposure. We recommend reducing the size of these units and redesigning them to provide more assurance of windfirmness to the adjoining stands. **ADGC-14**

Alternative 5, Preferred Alternative (page 27) The technique of "cutting into the wind" should be applied to all alternatives, not just alternative 5, since this has been identified as a wind prone area. According to the Timber Sale Preparation Handbook (FSH 2409.24) 154.32a Blowdown Hazard, "Some large stands of timber may have no windfirm break. If possible, plan the first cut at the leeward end of the stand, and plan subsequent cuts progressing into the wind." The timber along the Nesbitt ridge does not contain any natural, windfirm, breaks and should be treated as described above in all alternatives, not just Alternative 5. **ADGC-15** Construction of the road along the top of the Nesbitt ridge reduces the effectiveness of the travel corridor and increases access to critical deer habitat in both the Nesbitt ridge and the upper Snow Pass Old Growth Reserve. **ADGC-16** This alternative reduces impacts to wildlife habitat on the Nesbitt Ridge during this entry only. In addition, construction of road 52034 into the upper Middle Meter Bight Creek watershed presents an unnecessary risk to water quality, especially since this road accesses all suitable timber this entry and the next possible anticipated use would not be for 50-70 years. **ADGC-17**

Road Access Management (page 37)
We strongly support implementation of Road Access Management Option B, which will close specific roads. This option would reduce risk of impairment of water quality and minimize adverse impacts to wildlife. **ADGC-18**

Wildlife Habitat (page 101)
Figure 3-6, Existing Deer Habitat Capability Index Map, displays high HCI values for the beach fringe in the project area, most of which was harvested in the 1970's or has been blown down. We would like an explanation of why HCI values are so high in these managed stands. The Nesbitt ridge received a relatively low score (<.5), yet a USFS Wildlife Habitat Inventory of the Nesbitt Study Area in 1981 by Jay Ver Hoef and Joan Suther identified the Nesbitt ridge as being good deer winter range. The extent of past harvest in the beach fringe places more importance on the remaining deer winter habitat in the project area. **ADGC-19**

Old-Growth Forest (page 117)
The DEIS states "Future timber sales within the Project Area, likely to occur 20 to 30 years from now, will also likely remove additional high and medium volume old-growth. Partially offsetting the loss of old-growth habitat would be growth in past harvest units. Some units, especially those in the beach fringe, will be 70 to 80 years old by then. Thinning and/or creating **ADGC-20**

small openings in these stands could speed development of some of the structure found in old growth-stands." The managed stands along the road system in the project area, approximately 800 acres, were harvested in 1981 & 1988. Although a few of the managed stands in the beach fringe were harvested earlier, most harvest occurred in the 1970's. According to TLMP Table 3-108, Relative importance of conifer successional stages as habitats for management indicator species, early and mid-successional stages through 150 years is of the least importance for Sitka blacktail deer. TLMP further describes older clearcuts on page 3-366. "Older" Young Growth. These are stands 25-100 years in age, most of them a result of previous clearcut logging, but some may have resulted from natural disturbance events such as windthrow. The trees are even-aged, and the canopy is closed (greater than 90 percent canopy cover). Understory production is very low, typically less than 1/10th that of a productive old-growth stand. The limited understory of most older young-growth stands is dominated by mosses and ferns, with shrubs and forbs largely absent. Thermal cover and snow interception are generally good, although deep, wet snows can cause the branches of young-growth trees to deflect, with the snow then being deposited on the forest floor." **ADGC-20 cont.**

There have been 14435 acres previously harvested on Zarembo, 1151 of which has occurred in the project area. The DEIS does not discuss impacts to deer in relation to the 1954 capability. TLMP Table 3-110 shows WAA 1905(Zarembo Island) at 81percent of the 1954 capability in 1995. In addition, it states that deer habitat capability on Zarembo Island as a whole is expected to decrease to 66 percent of the 1954 capability by year 2095 as a result of programmed timber harvest. **ADGC-21**

Wind Ecology (page 137)

Appendix G of TLMP, Two-aged systems, page G-13 states: "Windthrow may have important ecological benefits by breaking up the podzol layers and bringing mineral soil to the surface. Leaving scattered green trees, that would be windthrown, may have important ecological benefits. Whether they blow down or remain standing, the residuals will perform several ecological functions important to the site. If left standing, they contribute to wildlife habitat, structural diversity, and visual variety. If they blow over, they contribute to mixing of mineral and organic soil layers." If the two-aged system for the Skipping Cow project area is intended to be used to promote windthrow in the residual stand, it will be of little benefit for wildlife. It can't be expected to have a dual purpose, especially in an area which is so vulnerable to high winds. Page 143 of the DEIS states: "In wind-sheltered areas most of the trees left after harvest are expected to remain standing." According to Figure 3-10, Areas Where Large-Scale Blowdown Predominates, this would be limited to units 1-4, 12-17, and 22-24. Units 5-11, 18-21,25 and 26, which account for 759 acres, or 67 percent of the harvest acres, are in the high wind area and residual trees can be expected to be highly susceptible to windthrow. Leaving residual trees in these stands will have little long-term benefit for wildlife. **ADGC-22**

Vegetation and Timber Resources (page196)

Table 3-33, Harvest Acres and Volume, on page 196 does not show any shovel yarding and it appears there may be several units where this is possible and better suited for achieving the objectives. (See individual unit comments.) The silvicultural prescriptions on many units do not take advantage of the uphill yarding capabilities and the opportunity to leave more retention within the units. **ADGC-23**

Cumulative Effects (page 116)

The discussion of elk on page 114 identifies important wintering areas for elk within the project area, however, the discussion of cumulative effects on page 119 does not address the potential increased competition between deer and elk. Kirchhoff and Larsen (1998) found "Clearcut logging, which is the predominate timber harvest method in Southeast Alaska, will create habitat conditions that likely favor elk over deer. Elk will better negotiate the deep snow that accumulates in young clearcuts and also will better process the relatively coarse forage (e.g., conifers and tall shrubs) that predominates in clearcuts. Over the long term, however, both deer and elk numbers will decline as first forbs, and then shrubs, are shaded and eliminated from the forest understory. Following canopy closure, understory production (all vascular plants) remains low for >100 years (Alaback 1982). Under these conditions, carrying capacity would be very low, and competition between deer and elk on the remaining suitable habitat would be relatively high." **ADGC-24**

Potential Improvement Projects (Appendix E)

We strongly encourage precommercial thinning of managed stands in both the beach fringe and within old growth reserves for wildlife habitat improvement. TLMP Wildlife Standards and Guidelines, Habitat Improvement Planning, page 4-113 identifies three factors to consider in assessing habitat improvement projects: a) to meet state wildlife population objectives; b) to meet subsistence use needs; and c) existing habitat in poor condition compared to its potential. In addition, the Beach and Estuary Standards and Guidelines, page 4-5, states: "Wildlife habitat restoration of young-growth conifer stands is encouraged to accelerate development of advanced seral stand structure. Treatments may include thinning of young stands, release, pruning, and fertilization." The beach fringe in the project area has been heavily impacted by previous harvest. Thinning would mitigate loss of critical deer winter habitat as a result of the proposed project and improve the future use of the beach fringe as a travel corridor between the Snow Pass and Round Point Old Growth Reserves. **ADGC-25**

Road Cards

We were very pleased with the quality of information provided on the road cards and hope this format will be the standard for all future timber sales. **ADGC-26**

Windfirmness of Class III stream buffers

We are concerned that several of the units, located in areas where large-scale blowdown predominates, contain buffers on Class III streams that may be highly susceptible to windthrow. These include units 8,9,10,11,18 and 26. We recommend that the Class III streams in these units receive a feathered buffer of at least one site potential tree in Alternatives 2,3 & 5, which prescribe various degrees of clearcutting. **ADGC-27**

Unit Cards

Unit 1: This unit is not located in an area where large-scale blowdown predominates, therefore, reserve trees would most likely be windfirm. The clearcut with reserves silvicultural prescription has little benefit for deer and does not seem to be the appropriate prescription for Alternative 5, which addresses wind ecology. We recommend group selection, which would more closely mimic gap phase blowdown. It is not clear why Alt. 4 has different stand management objectives **ADGC-28**

for each portion of the unit. The eastern portion (even-aged) contains higher deer habitat capability values than the western portion (two-aged). In addition, the western portion also contains 12 acres of high probability goshawk habitat. The unit also contains relatively higher deer habitat (.50).

Unit 2: This unit is not located in an area where large-scale blowdown, predominates, therefore reserve trees would most likely be windfirm. The clearcut with reserves silvicultural prescription has little benefit for deer and does not seem to be the appropriate prescription for Alternative 5, which addresses wind ecology. We recommend group selection, which would more closely mimic gap phase blowdown, and would take advantage of the uphill yarding opportunity to leave clumps within units that would be contain enough structure to benefit deer. **ADGC-28 cont.**

Units 3 & 4: It appears that these units could be yarded with shovel, which would be better suited to uneven aged system. They also contain relatively higher deer habitat capability index (.50). **ADGC-29**

Unit 5: While the upper half of the unit appears fine-textured and wind generated, the lower half of the unit has a high deer HCI value and the canopy appears to be more gap phase with small openings visible on aerial photos. We recommend 25% removal of trees over 9" in the lower portion of this unit. **ADGC-30** Page 108 of the DEIS states "During wildlife surveys in 1997, Forest Service personnel noted abundant goose signs at Mustang Lake and around a number of muskeg ponds (Posner unpublished report, 1998)." There is no mention of goose nesting habitat on the unit card and measures that will be taken if nesting geese are encountered within the unit. **ADGC-31**

Zarembo Island has experienced a great deal of wildlife habitat loss as a result of extensive areas of clearcut logging. There is also an extensive road system on the island. Currently Zarembo is an important deer hunting area for the communities of Wrangell and Petersburg. Deer populations are thought to be high because many logged areas in a successional stage which still provides abundant forage when not covered by snow. Effects of the recent severe winter on the deer population have not yet been evaluated, however. **ADGC-32**

The Division of Wildlife Conservation (DWC) prefers Alternative 4 as an action alternative. That alternative does not build a road up Nesbitt Ridge and it proposes selective logging in the Nesbitt Creek watershed which we believe will maintain more important deer winter habitat and minimize windthrow in wind prone areas on the ridge.

DWC opposes alternatives which build a road to the top of Nesbitt Ridge. As we have indicated several times in individual conversations with the Forest Service and its contractor and in a meeting with the IDT in October 1998, roading that part of the project area would make access to areas above the timber line too easy, possibly resulting in local overharvest of the deer population. Nesbitt Ridge is one of the last remaining blocks of old growth deer winter range on Zarembo. Field inspection by ADF&G and Forest Service biologists found evidence of a good deer population. The proposed clearcutting associated with the proposed road would fragment the best deer winter range in the project area as well as open up the hillside to unraveling by windthrow. The Forest Service admits that Nesbitt Ridge is a wind prone area yet it proposes **ADGC-33**

alternatives, including the preferred alternative, which have the likely result of exacerbating windthrow.

The discussion of wind ecology in the DEIS seems to draw the wrong conclusions about clearcut logging in wind prone areas. The Forest Service appears to be using the recent studies in wind ecology to justify clearcut logging. It also seems to be making the assumption that because there is evidence that some parts of the project area experienced a major windthrow event 250 years ago (see unit cards), another large windthrow event is imminent and the area might as well be clearcut. We do not agree that is necessarily the case.

Also, the DEIS suggests that in wind prone areas clearcutting mimics natural disturbance patterns. We also disagree with this conclusion. Wind in the Tongass typically topples trees in small patches averaging less than one-tenth of an acre and generally involving less than 10 trees per patch which is less than 25 percent of a given stand of trees. Rather than exacerbating windthrow in important deer winter range by clearcutting on a wind prone area such as Nesbitt Ridge, the Forest Service should seek to minimize windthrow over the life of the rotation by selection logging with helicopters as proposed in Alternative 4.

ADGC-34

It is not clear why the Forest Service is proposing harvest prescriptions for units in Alternatives 2 and 4 that would cut 70-80% of the trees greater than 9" dbh. Such a harvest pattern is no improvement over clearcuts for wildlife and does not constitute a real alternative to clearcutting. It would not seem to improve the visual resource either. In our view, if the Forest Service decides to log those units under that prescription it might as well clearcut them. We would prefer however, that the Forest Service demonstrate a greater commitment to alternatives to clearcutting and practice selection logging of units, removing not more than 25% of trees as proposed for units 5-11 in Alternative 4. If the goal is to maintain some habitat for wildlife in units 12-17, then a "lighter touch" harvest prescription (75% retention) should also be applied to those units.

ADGC-35

We found the narrative of DEIS in regard to deer poorly written and containing statements which seem to ignore the results of the past 20 years of deer habitat research on the Tongass. Pages 119-120 need to be rewritten to remove the implication that clearcutting provides good deer habitat and that the solution to forage loss when canopy closure occurs in second-growth stands is continued clearcutting of remaining old growth.

ADGC-36

The DEIS suggests that the IDT has made unilateral changes to the deer habitat capability model. The discussion on pages 104-106 claims that the model shows logging in Alternative 4 will increase deer numbers over the no action alternative. It is difficult to reconcile that claim with existing literature and results of research on the Tongass. The statement on page 105 that selective harvest of Nesbitt Creek units in Alt. 4 would "likely increase forage availability" needs to be clarified. Logging in winter range is more likely to *decrease* forage availability in winter because protective canopy is removed and the stand is more open. Increasing forage availability in non-snow conditions is not an improvement for deer as there already is extensive deer habitat in alpine, low-volume forest, and clearcuts. The concern on Zarembo and the limiting factor for deer is loss of winter range.

ADGC-37

The statement on page 106 that heavy winter mortality would occur on Zarembo in a harsh winter no matter which alternative is implemented also needs to be rewritten and clarified. In its context in the DEIS it implies that it does not matter what the Forest Service does in this timber sale or others on Zarembo. If this is what the Forest Service believes, then it is ignoring many years of research by Forest Service as well as ADF&G biologists, and numerous interagency workshops and discussions. Although winter kill of deer would be greater in a harsh winter than a mild winter, the amount and quality of remaining old growth habitat does affect the degree of severity of population loss. By avoiding logging of old growth deer winter range or selectively logging in winter range so that there is no appreciable change in stand canopy cover, the Forest Service can improve deer survivability over what it would be in a landscape where all winter range was converted to clearcuts or closed-canopy second growth. **ADGC-37 cont.**

Likewise statements on pages 130-131 which contend the effects of any alternative on deer populations would be "minor" need to be rewritten. The DEIS offers no basis for these statements or for the one on page 131 which states, "maintaining current conditions would not have a significant mitigating effect on deer winter habitat compared to the adverse effects caused by a series of harsh winters." The DEIS makes the error of assuming that because habitat in the project area does not have a high Habitat Suitability Index score on an absolute scale it is not high quality habitat and thus deer would not suffer if it were removed. As the model is constructed, a high absolute HSI score is impossible because presence of predators (wolves) and a medium "winter severity rating" reduce the range of possible scores. In addition, habitat needs to be evaluated in relation to what is available rather than to an ideal standard. Although winter habitat in the project area may not compare to the best on other islands it should not be assumed that it is not important to deer in surviving local winter conditions.

Letter 1
Alaska Division of Government Coordination—Jennifer R. Garland (ADGC)

Forest Service Response to ADGC–1

After the State reviewed the proposed Skipping Cow Timber Sale in the field, it issued a revised consistency finding on December 1, 1999. The State determined that the proposed activity was consistent to the maximum extent practicable with the policies of the Alaska Coastal Management Program.

Forest Service Response to ADGC-2

Your comment on road options is noted. Option B is the preferred alternative for managing roads.

Forest Service Response to ADGC-3

The information you provided on streams in units 8,9,10,11,18, and 26 accurately reflects the information on the unit card maps. The units in Alternative 5 received detailed field verification during 1999 (after the DEIS was published). The FEIS unit cards for these units contain information addressing buffer windthrow concerns and mitigation based on updated unit design and additional field information. At least one unit on your list (Unit 18), along with several others, will require additional field review to address buffer windfirmness during final unit layout. Other units were modified in the ROD.

Forest Service Response to ADGC-4

The unit card map (page B-64 of DEIS) is correct, the southern 60 acres would be two-aged management while the northern 21 acres would be clearcut. The unit card prescription was reversed. This has been corrected in the FEIS.

Forest Service Response to ADGC-5

The units in Alternative 5 received detailed field verification during 1999 (after the DEIS was published). The FEIS unit cards for these units contain information addressing buffer windthrow concerns and mitigation based on updated unit design and additional field information. At least one unit on your list (Unit 18), along with several others, will require additional field review to address buffer windfirmness during final unit layout.

Forest Service Response to ADGC-6

The comments are noted and the isolated portions shown in the DEIS have been deleted in the FEIS or the ROD. Some units appear in the DEIS to have isolated portions, but field review determined that these are due to mapping limitations and these were corrected. The units in Alternative 5 received detailed field verification during 1999 (after the DEIS was published). The selected alternative unit cards for these units (included with the ROD) reflect changes in unit design or stream verification that address your concerns.

Forest Service Response to ADGC-7

Your comment that the Nesbitt road reduces the effectiveness of the travel corridor and increases access to critical deer habitat is noted. On October 28, 1999, a field review was held with Jim Cariello and Ed Crain of ADF&G to refine the nature of this comment. They stated that the problem was motorized vehicle access to the Nesbitt Ridge area and the loss of security habitat in summer and fall (an important habitat component, especially for bucks). ADF&G also believes that the Nesbitt Ridge alpine complex would be very vulnerable to damage by all-terrain vehicle (ATV) use. Ed Crain stated that people walking into the area to hunt was not the problem. The Forest Service believes that closing the road addresses this problem. Also see ADGC-33. We are also considering a Road Closure Order for all motorized hunting between April 1 and December 31 on Road 52033. An open house was held in Wrangell in January 2000 to discuss the road issues. No one attended.

Forest Service Response to ADGC-8

Your comment on the response period is noted.

Forest Service Response to ADGC-9

Your comment on notification is noted.

Forest Service Response to ADGC-10

Approximately 25 percent of the productive forest is protected in beach fringe, riparian buffers, and high hazard soil areas. These areas, plus productive forest in the extensive old growth reserves adjacent to the Project Area, will provide critical winter habitat. Also, the productive forest managed for timber will be managed on a 200-year rotation (TLMP ROD, 1999). Through a rotation period, the managed stands in the Project Area will be a variety of age classes, providing different seral stages. The managed stands, in conjunction with the old growth reserves; the beach fringe; riparian buffers; and high-hazard soil areas are expected to meet the requirements stated in the Forest Plan for a full spectrum of wildlife needs on the island as a whole.

Forest Service Response to ADGC-11

Additional field reconnaissance has resulted in revising the diameter limit to approximately 24 inches diameter at breast height (DBH) because the stand does not contain 5 trees per acre over 30 inches. No murrelets were found in the area and the intent of the requirement was not to provide immediate mitigation for murrelets. Our biologists believe that leaving these trees is likely to have long-term benefits. These larger legacy trees, from what we know of murrelet nesting preferences, are likely to be used in the future.

Forest Service Response to ADGC-12

This is discussed in the FEIS, Chapter 3, Issue 5, the Effects section under Alternative 2 (which was on page 144 of the DEIS). This section discusses leaving 25 percent of the trees over 9 inches DBH may create a "feathering" effect, lessening the effects of the wind; however, some windthrow of leave trees is likely. This would emulate natural windthrow patterns over time. The term "wildlife" refers to the whole range of animal species—deer are only one of the many species that we manage for. Some mitigation measures are designed to benefit deer and other species, other measures are designed to primarily benefit species other than deer. The trees that remain standing will benefit those species that use standing trees, such as cavity nesters, especially years from now when a two-aged stand develops. Those trees that blow over will benefit species that use down trees, such as small mammals and amphibians. Deer may benefit from clumps of trees that provide hiding cover next to forage areas.

Forest Service Response to ADGC-13

Not all alternatives respond to every issue. Alternative 3 was designed to respond the issue of timber economics. However, it does contain mitigation measures to reduce blowdown along unit edges. Alternative 2 was designed to respond to the issue of protecting wildlife and reducing clearcutting. See response to comment ADGC-22 for a discussion on how it responds to the issue of windthrow.

Forest Service Response to ADGC-14

The forest on the upper two-thirds of Nesbitt Ridge appears to have been generated by a single wind event. Therefore, we did not favor Alternative 4 over Alternative 5. The partial harvest proposed for Nesbitt Ridge under Alternative 4 could, in our judgement, lead to accelerated windthrow over an extensive area. Alternative 5, in comparison, would only expose the eastern edges of Units 2, 6, and 8 to accelerated windthrow.

We have reduced the size of Unit 18 (which was 100 acres in the DEIS) to 70 acres. Extensive areas of over-steepened slopes and unstable boulder areas were discovered during field reconnaissance in the summer of 1999. These areas were removed from the unit. We also reduce the size of Unit 25 (which was 92 acres in the DEIS) to 86 acres. This change was made to remove non-productive areas within the unit that were discovered during the 1999 field reconnaissance. These changes were made in the final selected alternative.

Forest Service Response to ADGC-15

As discussed above, not all alternatives respond to every issue. The deciding official can incorporate portions of some or all of the alternatives in the final selected alternative, including cutting into the wind.

Forest Service Response to ADGC-16

This road would be closed following harvest activities to avoid impacts to the wildlife corridor. The location of the road closure, which is at stream crossing F (see Road Card 52033, pages C-22 through C-28 of the FEIS) will eliminate motorized access to the Nesbitt Ridge alpine area. Access by hunters that hike the closed road may increase.

Forest Service Response to ADGC-17

The project hydrologist and fisheries personnel field-reviewed this road to ensure that its location would minimize direct impacts to water quality and fisheries. The road does not cross any fish-bearing streams and its steep slope sections (MP 0.25 and MP 0.35) are not in close proximity to streams. For the reasons you suggest (as described on the road cards in Appendix C), this road will be placed in storage (closed) after the sale is concluded. All stream crossing structures, which are described on the road card, will either be removed or safeguarded to prevent failure during the storage period. The decision to remove or safeguard will be based on site evaluation at the conclusion of the sale.

Forest Service Response to ADGC-18

Your comment on preferring Road Management Option B is noted. Option B is the Preferred Alternative.

Forest Service Response to ADGC-19

The model assumes that low-elevation, south-facing harvest units less than 25 years old provide good forage and remain relatively snow-free. Therefore, these areas are given a relatively high value by the model. This is discussed in the FEIS, Chapter 3, Issue 3, under Management Indicator Species, in the Sitka black-tailed deer section (which was on page 100 in the DEIS). Most of the Nesbitt Ridge area is considered mid elevation by the model. Also, it faces east and has moderate snow levels. Therefore, it did not rate as high value habitat. The study referred to in the comment did not include any plots in the area proposed for harvest. This study is discussed in the response to comment USFWS-PB-2.

Forest Service Response to ADGC-20

We agree that stands 25 to 100 years old produce little forage. It is for that reason that the FEIS suggest that forage production could be improved by thinning or creating small openings.

Forest Service Response to ADGC-21

The FEIS compares current and post-harvest deer habitat (for each alternative) to historic conditions (prior to the beginning of timber harvest in the Project Area). This discussion is found in the FEIS under Issue 3: Wildlife Habitat Cumulative Effects (which were on pages 119-120, and on Table 3-11, page 77 in the DEIS). This is similar to, but more useful, than comparing it to 1954 conditions. Some harvest had already taken place in important deer habitat by 1954. We wanted to compare existing and post-harvest conditions to the conditions that probably existed prior to timber harvest.

Forest Service Response to ADGC-22

This is discussed in the FEIS, Chapter 3, Issue 5, the Effects section under Alternative 2 (which was on page 144 of the DEIS). Leaving 25 percent of the trees over 9 inches DBH may create a "feathering" effect, lessening the effects of the wind; however, some windthrow of leave trees is likely. This would emulate natural windthrow patterns over time. The term "wildlife" refers to the whole range of animal species; deer are only one of the many species that we manage habitat for. Some mitigation measures benefit deer and species with similar habitat needs. Other measures are designed primarily to benefit other species. The trees that remain standing will benefit those species that use standing trees, especially years from now when a two-aged stand develops. Those trees that blow over will benefit species that use down trees. Some trees, even within wind-prone areas, are less likely to blow down due to topographic position. Deer may benefit from these clumps of trees that provide hiding cover next to forage areas. Our field work in the Nesbitt area reveals that the lower one-third of the slope has been less affected by large-scale windthrow than the upper two-thirds. Therefore, we plan to leave a high percentage of the leave trees for these units in the lower third of the slope.

Forest Service Response to ADGC-23

Shovel yarding opportunities are limited because the terrain is normally greater than 30 percent in slope. Shovel yarding is limited to right-of-way clearing and small benches within close proximity of a road.

Forest Service Response to ADGC-24

A discussion on elk/deer competition has been included in the FEIS, Chapter 3, Issue 3, in the Sitka black-tailed deer section under Cumulative Effects. The long-term trends for deer and elk are discussed in the FEIS, Chapter 3, Issue 3,in the Sitka black-tailed deer section under Management Indicator Species (which was on page on pages 104-106 and 114 of the DEIS). It states that both deer and elk numbers will decline as forbs and shrubs are eliminated from the forest understory by the development of an overstory canopy that creates too much shade for these plants to grow. This is true of units in the Skipping Cow Timber Sale as well as other harvests units in Southeast Alaska. However, forage produced in future harvest units, existing harvest units that will be thinned (see Appendix E), old growth reserves, riparian buffers, and the beach fringe should help minimize population declines.

Forest Service Response to ADGC-25

Thank you for your comment on thinning. Precommercial thinning is recommended in Appendix E of the FEIS.

Forest Service Response to ADGC-26

Thank you for your comment on the high quality of the road cards.

Forest Service Response to ADGC-27

The edges of units exposed to the prevailing wind have been chosen to gain as much topographic screening as possible. The streams along these edges are, for the most part, in deeply incised draws. There will be no harvest within these draws and larger trees with significant crowns along the upper edges of the windward side will be removed to reduce the windthrow potential. The units in Alternative 5 received detailed field verification during 1999 (after the DEIS was published). The FEIS unit cards for these units contain information addressing buffer windthrow concerns and mitigation based on updated unit design and additional field information. At least one of the units on your list (Unit 18), along with several others, will require additional field review to address buffer windfirmness during final unit layout. Also refer to ADGC-3 and ADGC-5.

Forest Service Response to ADGC-28

The Project Area in general, and Units 1 and 2 in particular, are within the timber management LUD, as designated in the Forest Plan. The clearcut with reserves prescription was recommended because it would result in increased potential of regenerating Sitka spruce and yellow-cedar in these stands. Also, the growth rates and stand condition would be consistent with the desired future condition specified for this LUD in the Forest plan. The unit configuration generally avoids harvesting high value deer habitat and retaining high value deer habitat in Units 5 and 6 will be considered, as per your suggestion. Your comment preferring group selection is noted. The western portion of Unit 1 under Alternative 4 would have two-aged management while the eastern portion would have even-aged management. This was proposed because Alternative 4 does not include the road into the top of the unit. It would be helicopter-yarded. This prescription allowed us to leave many lower-value trees in the upper, or west, portion of the unit.

Forest Service Response to ADGC-29

Contours for these units are accurate. See the response to ADGC-23.

Forest Service Response to ADGC-30

Your recommended change to the prescription for Unit 5 was included in the Selected Alternative.

Forest Service Response to ADGC-31

No nesting geese were observed in Unit 5. Geese were observed in Mustang Lake (which is approximately 500 feet below Unit 5) and in several muskeg ponds on the ridge between Nesbitt Creek and the Snow Pass Creek drainage,

approximately 1 mile northwest of Unit 10. This is discussed in the FEIS, Chapter 3, Issue 3, in the Vancouver Canada Goose and Sandhill Crane section under Management Indicator Species (which was on page 108 of the DEIS).

Forest Service Response to ADGC-32

Your comments on the deer population on Zarembo Island and its importance to the local communities are noted.

Forest Service Response to ADGC-33

We believe that Alternative 5 would not unduly exacerbate windthrow compared to the other action alternatives. Alternative 5 is designed to reduce wind damage in the most wind-prone area, on the upper two-thirds of the slope where it appears that past windthrow has been on a very large scale. This is explained in the FEIS, Chapter 2, Alternative 5. The effects of Alternative 5 are discussed in the FEIS, Chapter 3, Issue 5, under Effects, in Alternative 5 section (which was page 146 in the DEIS). We are evaluating retaining more trees in the lower third of Units 5 and 6 in Alternative 5. We believe that retention trees in the lower third are less likely to blow down. This will help retain the value of the highest ranking habitat of the proposed harvest units. All alternatives in the EIS generally avoid harvest of high value deer habitat. The lower portions of Units 5 and 6 are the only high value deer habitat proposed for harvest (as displayed by the deer model Figure 3-6 of the FEIS). Your comment relating to Units 5 and 6 are noted. Also, see the response to comment ADFG-7. One point of clarification, only the lower third of the Nesbitt Ridge area is within the old growth development stage. The upper two-thirds of this area are in the early to middle understory reinitiation stage of forest development (FEIS, Chapter 3, Issue 5, in the Forest Stand Dynamics section and Oliver, 1996).

Forest Service Response to ADGC-34

The blowdown in the upper two-thirds of the Nesbitt Ridge area is not limited to small patches, with less than 10 trees per patch and to less than 25 percent of a stand. As discussed in the FEIS, Chapter 3, Issue 5 in the Forest Stand Dynamics section (was on page 140 of the DEIS), typically, catastrophic blowdown can result in nearly all trees blowing down over areas up to 50 acres. However, as stated on page 14 of the FEIS, much of the forest in the Nesbitt Creek blew down in a wind storm approximately 250 years ago. This type of event may never occur again. On the other hand, an event that happened one tree generation ago may very well reoccur in the same area. The prescriptions proposed for Alternative 5 make use of these site-specific observations in the strategy proposed for managing the Nesbitt area.

Forest Service Response to ADGC-35

We believe that leaving 20 to 60 trees over 9 inches DBH, plus many smaller trees, would have greater value for wildlife than clearcutting. Also, as discussed in the FEIS, Chapter 3, Visual Resources, under Effects, in the Alternative 2 section (was on page 204 of the DEIS), the harvest units proposed in Alternative 2 would be less noticeable because of these leave trees. See the response to comment CWP-20 for effects on wildlife. The reserved trees under the alternatives would provide stand structure and diversity over time, but the alternatives have varying degrees of risk related to future windthrow. How many trees to leave under each alternative is also a balance between the economics of harvest, the type of yarding system used, and the effects to other resources, such as wildlife. Leaving such trees also requires consideration of the risk of blowdown. Part of the reason for developing alternatives with different approaches is to analyze and compare the tradeoffs that the alternatives highlight.

Forest Service Response to ADGC-36

Comment is noted and some rewording has been done for the FEIS to clarify the intent. The section referred to does note the early forage production for deer that is produced by clearcutting. This forage may be contributing to the current high deer population on the island.

Forest Service Response to ADGC-37

The interdisciplinary team (IDT) did not make any changes to the deer habitat capability model. The difference in the values between the Forest Plan and the DEIS is a result of running the model at different scales, not the result of changing the model for this project. The model was run for the Forest Plan using point data and then the values were extrapolated to the larger area. We ran the model for this project using polygon data that is more site-specific

and accurate. However, we rechecked the numbers and found an error in the way the model was run. This resulted a minor change in the capability values for Alternative 4. These have been corrected in the FEIS. The DEIS stated that creating small openings in the uniform canopy could increase forage production while leaving enough of the canopy to provide cover from snow. In mild winters, this might increase deer numbers. In most winters, this could improve deer winter habitat slightly. However, the DEIS also stated that there are so many deer on Zarembo Island and so little high value winter habitat that a harsh winter would kill many deer. Minor alterations in habitat will not affect this fundamental conclusion greatly one way or the other. The FEIS has been reworded to make these statements clearer to readers.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

RECEIVED
OCT 5 1999
FOREST SERVICE

September 29, 1999

Reply To
Attn Of: ECO-088

Ref: 98-031-AFS

Carol J. Jorgensen
Assistant Forest Supervisor
Stikine Area
Tongass National Forest
P.O. Box 309
Petersburg, Alaska 99929

Dear Ms. Jorgensen:

The Environmental Protection Agency has received the Draft Environmental Impact Statement (EIS) for the proposed **Skipping Cow Timber Sale** for review in accordance with our responsibilities under the National Environmental Policy Act and Section 309 of the Clean Air Act. The EIS evaluates strategies for harvesting timber on the South Zarembo Island, located approximately 10 miles west of Wrangell, Alsaka.

EPA Region 10 has used a screening tool to conduct a limited review of the draft EIS and, based upon the screen, we do not foresee having any environmental objections to the proposed project. Therefore, we will not be conducting a detailed review of the draft EIS. EPA #1

Should you have any questions, please contact Bill Ryan of my staff at (206) 553-8561.

Sincerely,

Richard B. Parkin

Richard B. Parkin, Manager
Geographic Implementation Unit

cc: Steve Brady, WRD

Printed on Recycled Paper

Letter 2
Environmental Protection Agency (EPA)

Forest Service Response to EPA-1

Thank you for reviewing the DEIS. We are pleased that you do not foresee having any environmental objections to the proposed project.

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, ALASKA
JUNEAU REGULATORY FIELD OFFICE
JORDAN CREEK CENTER
8800 GLACIER HWY, SUITE 106B
JUNEAU, ALASKA 99801-8079

REPLY TO ATTENTION OF:

RECEIVED
AUG 27 1999
FOREST SERVICE

August 24, 1999

Regulatory Branch
East Section
9-990961

Mr. Steve Brady
U.S. Forest Service
Post Office Box 51
Wrangell, Alaska 99929-0051

Dear Mr. Brady:

This is in response to the June 1999, Skipping Cow Timber Sale Draft Environmental Impact Statement (DEIS), describing a proposed timber sale on the south half of Zarembo Island, approximately 10 miles west of Wrangell, Alaska. The project was reviewed pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors act of 1899. Section 10 of the Rivers and Harbors Act of 1899 requires that a Department of the Army (DA) permit be obtained for certain structures or work in or affecting navigable waters of the United States (U.S.), prior to conducting the work (33 U.S.C. 403). Section 404 of the Clean Water Act requires that a DA permit be obtained for the placement or discharge of dredged and/or fill material into waters of the U.S., including wetlands, prior to conducting the work (33 U.S.C. 1344).

For regulatory purposes, the Corps of Engineers (Corps) defines wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Navigable waters of the U.S. are those waters subject to the ebb and flow of the tide shoreward to the mean high water mark, and/or other waters identified as navigable by the Alaska District. Based on a review of the information you provided and other information available to our office, the proposed work would affect waters of the U.S., including wetlands, subject to Corps jurisdiction.

Section 404(f)(1)(a) of the Clean Water Act states, in part, that normal silvicultural activities for the production of forest products, which are part of an established, ongoing operation, are not subject to regulation under Section 404 of the Clean Water Act. Section 404(f)(1)(e) states that the construction or maintenance of forest roads for silviculture activities is exempt from regulation under Section 404 of the Clean Water Act, provided the roads are constructed and maintained in accordance with Best Management Practices (BMPs) listed at 33 CFR 323.4(a)(6). The Corps has the responsibility to assure that activities performed under the exemptions meet the conditions included in the Act, implementing regulations, BMPs and subsequent national guidance. COE-1

-2-

The DEIS states that between 7 and 17 acres of wetlands would be impacted by road construction depending on the alternative selected and Table 3-20 indicates that the proposed action (Alternative 3) would construct approximately 16.2 miles of new roads (both temporary and system roads). Under Road Management Option A, all system roads would remain open following the sale and all temporary roads would be closed with natural drainage restored. Under Road Management Option B (your preferred option), existing roads would remain open and new roads would be decommissioned or closed. Gates would be installed at Roads 6594 and 52033 as a barrier to off-road vehicle use.

Figure 2-3 shows the proposed roads that would be constructed under the preferred alternative and Figure 3-12 reflects the wetland mapping for area. Several of the existing Road 6594 crossings would be modified to improve resident fish passage (e.g., MPs 2.053, 5.069, 5.281). The DEIS also states that approximately 200' of resident fish habitat exists upstream of the Road 6594 crossing at Milepost 3.8, and the road card indicates that fish passage is not required due to the high cost of a bridge and the minor amount of habitat that would be retained. The BMP for road crossings under the Clean Water Act 404 forest road exemption (33 CFR 323.4 (a)(6)(vii)) states that the design, construction and maintenance of the road crossing *shall not disrupt* the migration or other movement of those species of aquatic life inhabiting the water body. In this regard, the MP 3.8 crossing would not be exempt from DA authorization unless it provides for resident fish passage and complies with the forest road BMPs. However, the DEIS is unclear as to whether or not the existing crossing provides for resident fish passage which may be an extenuating factor. COE-2

The DEIS indicates that an existing log crib equipment offloading bulkhead in Roosevelt Harbor would be reconstructed and that an existing log transfer facility in Deep Bay harbor would be used. The DA permits require authorized structures to be maintained in good condition and in conformance with the terms and conditions of the permit (including the authorized plans). If the Roosevelt Harbor bulkhead or the Deep Bay LTF are not serviceable in their current condition(s), DA authorization would be required for the proposed improvements. We will advise you of particular regulatory requirements for this work upon receipt of the permit file numbers or a copy of the permits for the subject facilities, a description of their current condition and details of the proposed work. DA authorization would also be required for appurtenant structures (e.g. floating camps, rafting areas, outfalls, intakes, equipment docks, floats, breakwaters, etc.) constructed in areas subject to Corps jurisdiction. COE-3

Thank you for the opportunity to comment on the Skipping Cow Timber Sale. We are available for further discussion or clarification of our comments or regulatory requirements, as necessary. Please contact me at the letterhead address, by telephone at (907) 790-4490, or by FAX at (907) 790-4499 if we can provide further information.

Sincerely,

R. Thompson

Ralph W. Thompson
Field Office Manager

Letter 3
Department of the Army, Corps of Engineers (COE)

Forest Service Response to COE-1

Your comments on the role of the Corps are noted.

Forest Service Response to COE-2

Additional field review of this site resulted in verifying a resident fish population up to nearly 1,000 feet upstream of the road crossing. We have amended the FEIS narrative for Road Card 6594, MP 3.800 to read: "Install drainage structure to provide resident fish passage. Structure required may be an oversized corrugated metal pipe arch, corrugated metal pipe arch with baffles, bottomless arch pipe, or a bridge."

Forest Service Response to COE-3

Thank you for the information on permit requirements.

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UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
P.O. Box 21668
Juneau, Alaska 99802-1668

RECEIVED
JUN 10 1999
FOREST SERVICE

June 4, 1999

Mr. Steven J.Brady
District Ranger
Wrangell Ranger District
P.O. Box 51
Wrangell, Alaska 99929

RE: Skipping Cow Timber Sale, Section 7 Consultation

Dear Mr. Brady:

We have reviewed your Biological Assessment for threatened endangered species occurring in the Skipping Cow Timber Sale project area on Zarembo Island, Alaska. We concur with your determination that no threatened or endangered species or designated critical habitats under the jurisdiction of the National Marine Fisheries Service are likely to be affected by the proposed action. No allowable incidental take is provided under this determination. Pursuant to Interagency Cooperation (50 CFR 402.13(a)), this consultation is terminated.

NMFS #1

We appreciate your efforts in continued coordination with the National Marine Fisheries Service. Should you have any further questions regarding this consultation, please contact Andrew Grossman, Habitat Conservation Division, (907) 586-7358.

Sincerely,

For Steven Pennoyer
Administrator, Alaska Region

Letter 4
National Marine Fisheries Service (NMFS)

Forest Service Response to NMFS-1

Thank you for your comments. We are pleased that you concur with our determination that threatened and endangered species and critical habitats under your jurisdiction are not likely to be affected by the proposed action.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Juneau Field Office
3000 Vintage Blvd., Suite 201
Juneau, Alaska 99801-7100

(907) 586-7240

IN REPLY REFER TO:

RECEIVED
JUN 10 1999
FOREST SERVICE

June 7, 1999

Stephen J. Brady
District Ranger
Tongass National Forest
Wrangell Ranger District
P.O. Box 51
Wrangell, AK 99929

Dear Mr Brady:

The U.S. Fish and Wildlife Service has reviewed the biological assessment, dated May 1999, for threatened and endangered species that may occur in the vicinity of the Skipping Cow Timber Sale, Zarembo Island, Alaska. The assessment evaluated the effects of proposed actions on the endangered American peregrine falcon (Falco peregrinus anatum).

For the purposes of Section 7 consultation, we agree that populations of the American peregrine falcon will not likely be adversely affected as a result of the proposed project. USFWS-JL-1

Although not specifically required by the consultation provisions of the Endangered Species Act, we appreciate your consideration of the Service's Species of Concern in the biological assessment. Your consideration of these species is important for their conservation and assists in preventing their inclusion on the Endangered Species list. USFWS-JL-2

These comments are offered for endangered and threatened species for which the U.S. Fish and Wildlife Service has responsibility under Section 7 of the Endangered Species Act of 1973 (16 USC 1521 et seq.) and its amendments. The above comments are specific to the Endangered Species Act and do not reflect agency concerns regarding other organisms or habitats for which the Service has legislated responsibilities. USFWS-JL-3

I note the (PO Box) address used to send the subject document is out of date. So that we may provide information to you in a timely fashion, please use the following address for all correspondence to this office:

U.S. Fish and Wildlife Service
3000 Vintage Blvd., Suite 201
Juneau, AK 99801

Sincerely,

John Lindell
Endangered Species Biologist

Letter 5
U.S. Fish and Wildlife Service-John Lindell (USFWS-JL)

Forest Service Response to USFWS-JL-1

Thank you for your comments. We are pleased that you concur with our determination that populations of peregrine falcons will not likely to be adversely affected by the proposed action.

Forest Service Response to USFWS-JL-2

Thank you for your comment on our consideration of Species of Concern in the biological assessment.

Forest Service Response to USFWS-JL-3

Thank you for your comment. We understand that your comments in this letter only deal with threatened and endangered species.

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
1689 C. Street, Room 119
Anchorage, Alaska 99501-5126

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ER 99/0696

September 30, 1999

Mr. Steve Brady
District Ranger
USDA Forest Service
Tongass National Forest - Stikine Area
P.O. Box 51
Wrangell, Alaska 99929

Dear Mr. Brady:

In response to your June 1999 request, we have reviewed the Draft Environmental Impact Statement (EIS) for the Skipping Cow Timber Sale. The U.S. Forest Service is proposing a timber sale of approximately 20 to 24.4 million board feet of timber, and construction and maintenance of associated roads and log transfer facilities on Zarembo Island, which is 10 miles west of Wrangell, Alaska, in the Tongass National Forest.

U.S. Fish and Wildlife Service Biologist, Carol Hale, participated in several interagency meetings and visited the project area on July 7-10, 1997, and June 16, 1998. Our comments are based on information gathered during those meetings and site visits, our understanding of the Revised Tongass Land Management Plan (TLMP), and other cited references.

ROAD ACCESS MANAGEMENT

There are three areas where road construction is proposed in the project area: Upper Nesbitt Creek (including Mustang Ridge), Middle Meter Bight Creek, and Vial Creek. Alternatives 2, 3, and 5 propose road construction ranging from 5.7 to 7.2 miles into the Upper Nesbitt Creek/ Mustang Ridge area. Alternatives 3 and 5 propose construction of 2.2 miles of road into the Middle Meter Bight area. All action alternatives propose 2.4 miles of new road in the Vial Creek watershed.

The Draft EIS gives two options for road access management, which vary slightly among alternatives. Option A would leave all new and existing system roads open and maintained for public use after the sale. Option B would: (1) maintain all existing open roads; (2) close new roads 52034, 52032, and the new section of Road 6594 until they are needed again, and; (3) install gates at the beginning, or at mile post 0.83 of Road 52033, and at mile post 5.45 on Road 6594. All temporary roads would be permanently closed after the sale in either option.

Construction and use of roads can impact fish and wildlife in many ways. We are concerned that activities associated with construction of the proposed roads will disturb Vancouver Canada geese and sandhill cranes in their nesting and brood-rearing areas (see the Vancouver Canada Goose and Sandhill Crane Section below). Zarembo Island is a popular deer hunting area, and use of proposed roads could also result in excessive hunting pressures on the deer population that use the Upper Nesbitt Creek and Mustang Ridge areas. The proposed road in the Middle Meter Bight Creek, and Vial Creek areas will likely increase sediment loads in certain fish streams (see the Fisheries and Watershed Section below). Proposed road closures may not be enough to protect wildlife in certain areas. As stated in the Draft EIS: "...even closed roads would increase walking use of the area, which could increase hunting pressure" (page 64), and some people may use roads illegally (page 65). USFWS-PB-1

Upper Nesbitt Creek contains the largest contiguous stand of high volume, low elevation, old-growth forest habitat in the project area. The Upper Nesbitt Creek stand may be important deer winter habitat of higher value than the "low" and "medium" value depicted on Figure 3-6 (page 101) in the Draft EIS (E. Crain, Alaska Department of Fish and Game Wildlife Conservation Biologist, personal communication). According to an unpublished USDA Forest Service report titled "Wildlife Habitat Inventory, Nesbitt Study Area," this stand was rated as "good" deer winter habitat (Hoef and Suther 1981). It is difficult to compare studies, however, because a different model and rating terminology were used to define deer winter habitat. The Nesbitt Ridge alpine area above the forest stand is also used as deer summer habitat (E. Crain, personal communication). We recommend that a winter survey be conducted in the Upper Nesbitt Creek stand and ridge to determine its deer winter habitat value and that the results be included in the Final EIS. Furthermore, we suggest that the selected alternative exclude Road 52033, if this area is determined to be high value deer winter habitat. USFWS-PB-2

WILDLIFE HABITAT

Old-Growth Forest: The TLMP (page 4-4) designates a 1,000-foot-wide beach fringe along all shorelines in the Tongass National Forest to provide forested connectivity among intact blocks of old-growth forest interior (Julian 1997). Past timber harvest has compromised the forest connectivity in the beach fringe along the south shore of Zarembo Island between the Round Point Old-Growth Reserve (OGR) and the Snow Pass OGR. The TLMP (page 4-5) encourages management of young-growth conifer stands to accelerate seral development. We believe the Final EIS should address pre-commercial thinning in the beach fringe along the south shore of Zarembo Island to accelerate seral development. USFWS-PB-3

The Draft EIS (page 79) identifies a wildlife travel corridor oriented in an east-west direction between Round Point and Snow Pass OGRs. This corridor, though containing several natural breaks and being bisected by the Road 6594, appears to be the best existing forested connection between these two OGRs. We suggest that alternatives in the Final EIS exclude Road 52033 to prevent this connection from being further compromised (see the Road Management section above). USFWS-PB-4

Page 2 of 8

The Draft EIS (pages 74, 77, and 100) indicates that the Timber Strata (TIMSTRA) map was used to determine location, value, and quantity of wildlife habitats. Our experience using the TIMSTRA model has lead us to conclude that it is not the best tool for assessing the value of specific old-growth forest stands as wildlife habitats. Using Geographic Information System data layers for the Skipping Cow project area, we developed volume class maps with information from the TIMSTRA model and the Timber Type (TIMTYP) model. The products from these two queries differed. We believe that the volume class map developed from the TIMTYP model yields a more precise representation of old-growth forest wildlife habitat because it relies on forest structure attributes, such as species composition, stand age, decadence, canopy cover, and tree crown size. Conversely, the TIMSTRA model only uses the volume class and forest type attributes. It is neither designed, nor precise enough, to distinguish between important old-growth forest structures that can and should be separated when assessing the potential value of an area as wildlife habitat. It is our recommendation that important old-growth-forest-related wildlife habitats be redefined in the Final EIS using the TIMTYP database. USFWS-PB-5

Marbled Murrelet: The Draft EIS (page 22) states that all the action alternatives would "protect" marbled murrelet habitat by retaining at least 5 trees over 30 inches diameter at breast height (DBH) per acre in Units 12 through 15. The management prescription for these units in Alternatives 2 and 4 is to harvest 70 to 80 percent of the trees over 9 inches DBH, which is known as two-aged management. The management prescription for the units in Alternatives 3 and 5 is clearcuts with reserve trees. No data are available to support the statement that the prescribed harvest strategies will "protect" marbled murrelet habitat. We recommend that the Final EIS include a reevaluation of the impacts of the proposed action on marbled murrelet habitat and that this statement be deleted. USFWS-PB-6

Sitka Black-tailed Deer: The Draft EIS (page 105) shows the habitat capability for the project area would be greater under Alternative 4 than the "No Action" alternative, although it was determined that high-valued deer winter habitat would decrease slightly in all action alternatives. The Sitka black-tailed deer model is used to assess deer-habitat capability based on winter deer range abundance and quality. It is unclear how Alternative 4 could have a higher habitat capability than the no Action Alternative when Alternative 4 includes timber harvest (Nesbitt Creek units) in some of the best winter deer habitat in the project area. We recommend that the estimated deer habitat capability for Alternative 4 be recalculated and corrected if necessary in the Final EIS. USFWS-PB-7

Vancouver Canada Goose and Sandhill Crane: "Signs" of Vancouver Canada goose nesting have been noted at Mustang Lake and in several muskegs in the project area (Posner 1998). Sandhill cranes were seen in the Nesbitt Creek watershed, 0.5 miles southwest of Mustang Lake, 0.5 miles north of Mustang Lake, and near the end of the Road 52008, but no nests were found (Posner 1998). The Draft EIS concludes that no substantive adverse effects to Vancouver Canada goose and sandhill crane nesting habitats are likely under any of the alternatives, but there could be some localized disturbance due to road construction and helicopter logging. We concur that nesting and brood rearing areas could be disturbed by road construction and timber harvest, USFWS-PB-8

especially by helicopter logging. The TLMP Standards and Guidelines (page 4-115) give directions to protect these areas:

- Locate facilities and concentrated human activities requiring Forest Service approval as far from known waterfowl or shorebird concentration and nesting areas as feasible. Minimize disturbance of waterfowl by restricting, when feasible, development activities to periods when waterfowl are absent from the area.

- Minimize human disturbance of habitats during important periods of the year (nesting and brood-rearing, molting, and winter) by managing human use (such as trails and Off-Highway Vehicle use) in significant wetland areas. The following distances are provided as guidelines for reducing human disturbance:

  (a) Provide a minimum distance of 330 feet (100 meters) between human activities on the ground and significant areas being used by other waterfowl.

The Draft EIS proposes a timing restriction for road construction and timber harvest in Units 5, 7, and 23 between April 15 and June 15. We believe this period may not be early enough or long enough to prevent substantive adverse effects to the goose and crane nesting habitat in the project area, and suggest the Final EIS use the revised dates noted below.

USFWS-PB-8 cont.

There are limited data on nesting geese and cranes in Southeast Alaska. By backdating two nests with known hatch dates and using an estimated incubation period of 28 days, Lebeda and Ratti (1983) defined a preincubation period (courtship, finding an appropriate site, and building the nest) for Vancouver Canada geese on Admiralty Island as April 8 to April 23, an incubation period as April 24 to June 7, and a postincubation period (brood-rearing) as June 8 to August 9. Livezey (1978) documented Vancouver Canada goose hatching from May 10 to as late as June 20. Backdating 28 to 30 days from May 10 for incubation (Bellrose 1980; Brakage 1965; Lebeda and Ratti 1983; Van Horn, Harrington, and Ratti 1979), geese may be arriving at nesting areas on Zarembo Island in early April.

Canada goose goslings are altricial, staying with their parents until they are fledged (Bellrose 1980). We were unable to find data on how long Vancouver Canada goose goslings in Southeast Alaska are flightless, but according to Bellrose (1980) Canada goose goslings in British Columbia are flightless for 63 days. Flightless Vancouver Canada goose goslings use old-growth forest habitat with heavy understory for cover (Van Horn, Harrington, and Ratti 1979; Warner, Reid, and Fay 1980; Lebeda and Ratti 1983). If hatching is still occurring as late as June 20, as recorded by Livezey (1978), we surmise that the goslings hatched in the project area could still be using forest stands adjacent to the nesting area for cover as late as August 20. However, most recorded Vancouver Canada goose hatch dates are in late May or early June (Warner, Reid, Fay 1980; Lebeda 1980; Lebeda and Ratti 1983); therefore, most goslings could be fledged by July 31.

We recommend that the Final EIS indicate road construction, blasting, timber harvest, and helicopter logging be avoided within 330 feet of Vancouver Canada goose nesting and brood-rearing habitat between April 1 and July 31.

Adult and flightless juvenile sandhill cranes have been seen during summer months in the Mustang Lake area on Zarembo Island in recent years, suggesting that cranes are nesting in the project area. There are very few data on nesting sandhill cranes in Southeast Alaska. During a 1975 study on the Yukon-Kuskokwim Delta, sandhill cranes arrived at their nesting area the first week in May and began incubating by May 14 (Boise 1977). Hatching occurred from June 16 through July 1. Sandhill cranes likely arrive in Southeast Alaska before the Yukon-Kuskokwim Delta sandhill cranes arrive at their nesting areas. With little data on sandhill cranes in Southeast Alaska, we can only guess they are nesting on Zarembo Island at roughly the same time as Vancouver Canada geese. We therefore suggest using the same road construction and timber harvest timing restrictions we recommended above for Vancouver Canada geese to minimize sandhill crane nesting disturbance. **USFWS-PB-8 cont.**

SUBSISTENCE

Deer Habitat Effects: We disagree with the conclusion, on page 132, regarding road effects on deer subsistence hunting that states: "it is unlikely that the measurable consequences of whatever action is chosen will be much different from those of any of the other alternatives." The Draft EIS discusses the adverse consequences of additional roads on the deer population on Zarembo Island. Alternative 3 proposes constructing 16 miles of new roads into unroaded areas and reopening one mile of existing road, while the "No Action" alternative proposes no roads at all. We believe hunter access and permanent deer habitat loss would increase as the amount of roads increase in the project area. Alternatives that include the most road mileage, particularly in deer winter habitat, would have the greatest potential impact on deer populations. Effects from roads and habitat loss would cumulatively cause a decrease in the deer habitat capability of Zarembo Island in the long-term, potentially causing a decline in subsistence hunter success (see the discussion in the Road Access Management section above). We recommend the conclusion quoted above be deleted for the Final EIS. **USFWS-PB-9**

WIND ECOLOGY

The Draft EIS (pages 144 to 146) includes a discussion of how each alternative would mimic the different types of wind disturbances (e.g. partial disturbance, stand-replacement disturbance, natural small-scale disturbance, and large-scale wind damage). We believe it is probable, however, that on a landscape scale, past and planned timber harvest on Zarembo Island has exceeded the natural rate of disturbance caused by wind. It may be too late to mimic natural disturbance at a landscape scale on Zarembo Island. To accurately portray the ecological consequences of the selected action, we suggest the Final EIS include an analysis of the rate of natural wind disturbance in the project area and how the results of each alternative would compare to it. **USFWS-PB-10**

Page 5 of 8

FISHERIES AND WATERSHEDS

The Vial Creek and Middle Meter Bight watershed contains numerous unstable, high gradient, contained channel types which are highly prone to debris slides. These channels feed directly into a Class I stream. We are concerned that increased sedimentation from logging and road construction will affect known pink and chum salmon spawning areas in lower stream reaches. We recommend that the Final EIS exclude road construction from this area (and other areas dominated by high gradient contained channels and unstable soils) to protect fish habitat. We encourage selective helicopter yarding as an alternative to road construction and full-suspension yarding across any stream reaches in this area. Accelerated slope failure rates would likely increase sediment loads into floodplain channels downstream that are sensitive to additional sediment inputs from timber harvest, road construction, and altered stream flows from effects of road crossing structures. Floodplain channels typically are important spawning, rearing and overwintering areas for both anadromous and resident salmonids and could be adversely affected by increases in sedimentation. USFWS-PB-11

If harvest is to occur along any Class IV streams, we suggest the Final EIS Unit and Road Cards contain site-specific restrictions that will protect stream channel integrity and ability to deliver water and sediment to downstream fish habitat. USFWS-PB-12

We suggest listing in the Final EIS, all fish stocks located in the project area and on adjacent lands that may be affected by the proposed timber harvest and road construction. Furthermore, we suggest including discussions of proposed fish monitoring, including the potential for increased sport and subsistence fish harvests due to increased road access. USFWS-PB-13

VEGETATION AND TIMBER RESOURCES

Harvest Methods: One objective for the TLMP Timber Production Land Use Designation (page 3-144) is to "seek to reduce clearcutting when other cutting methods will meet land management objectives." The Draft EIS alternatives do not offer many alternatives to clearcutting. Alternative 2 includes harvest of 70-80 percent of trees over 9 inch DBH only. Alternatives 3 and 5 offer clearcuts with reserves. Both of these prescriptions function as clearcuts when considering wildlife habitat. Only Alternative 4 offers 25 percent removal of trees over 9 inch DBH prescription in some of the units. We suggest more and different alternatives to clearcutting be offered, including individual tree selection, in more than one alternative in the Final EIS to maintain more forest structure and old-growth habitat characteristics. USFWS-PB-14

SPECIFIC COMMENTS

Chapter 3, page 99. We believe that the sentence "Open road densities on Zarembo Island would remain under the 1 mile per square mile threshold in all Alternatives . . . " should read, "Open road densities on Zarembo Island would remain under the 0.7 mile per square mile threshold in all Alternatives . . . " USFWS-PB-15

Page 6 of 8

Chapter 3, page 108. The Draft EIS refers to Road 52008, but it is not depicted on any map in the document. We recommend that the road map in the Final EIS include a label for this road. USFWS-PB-17

SUMMARY

In summary, our most important concerns and recommendations about fish and wildlife conservation in the Skipping Cow Timber Sale project area are related to the effects of road construction and use, old-growth connectivity, and alternatives to clearcutting. Considering the important wildlife habitat in and above the Upper Nesbitt Creek large old-growth stand, we recommend deferring Road 52033. We also recommend deferring Road 52034 to protect the pink and chum salmon spawning areas in the lower stream reaches, and encourage selective helicopter logging in areas dominated by high gradient contained channels and unstable soils. We recommend extending the road construction and timber harvest restriction period to April 1 through July 31 to protect Vancouver Canada goose and sandhill crane nesting and brood-rearing. We believe it is important to maintain the connectivity between the Round Point OGR and the Snow Pass OGR for a wildlife corridor. We encourage you to consider including more alternatives to clearcutting in each alternative to maintain more forest structure and old-growth characteristics.

We appreciate the opportunity to participate in the planning of the Skipping Cow Timber Sale project. Carol Hale is the lead biologist for the Fish and Wildlife Service on this project; please contact her at 907-586-7349, if you have questions about these comments and when opportunities arise to participate in any future meetings or field work.

Sincerely,

Pamela Bergmann

Pamela Bergmann
Acting Regional Environmental Officer - Alaska

Page 7 of 8

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Letter 6
U.S. Fish and Wildlife Service—Pamela Bergmann (USFWS-PB)

Forest Service Response to USFWS-PB-1

See responses below.

Forest Service Response to USFWS-PB-2

The harvest units proposed for the Nesbitt area are generally mid-elevation stands, between 800 and 1,500 feet elevation. That is why the model does not rate them as high value. This does not conflict with the results of the Wildlife Habitat Inventory (Hoef and Suther, 1981). None of the plots from this study are near the proposed harvest units. The closest plots are approximately 1 mile from the beach or in the old growth reserve. Those in the reserve were given a fair rating. The plots showing high value habitat are approximately 1 mile from the beach, in the southwest corner of the Project Area. No harvest is proposed in this area. Also see response to ADFG-19.

Forest Service Response to USFWS-PB-3

Precommercial thinning in existing harvest units is discussed as a potential project in Appendix E of the FEIS.

Forest Service Response to USFWS-PB- 4

Road 52033 would be closed after harvest under Option B to reduce potential impacts to the wildlife corridor. Alternative 4 would not build the road, and Alternative 5 would not extend the road through the lower fork of the corridor. In the Selected Alternative, all drainage structures after the sale closes will be removed from Road 52033 and a Forest Order prohibiting motorized use of it from April 1 through December 21 will be issued. This has been done to respond to the importance of Nesbitt Ridge as summer and fall deer habitat.

Forest Service Response to USFWS-PB-5

We believe that the TIMSTRA database is the correct tool to use. The Forest Plan made use of the TIMSTRA database for most applications and direction from the Forest Supervisor and the Regional Office has been to use TIMSTRA for consistency whenever possible. Those models that have been revised to use TIMSTRA display results using this database. We do acknowledge the utility of the TIMTYPE database for some applications, which is why we have provided these GIS covers.

Forest Service Response to USFWS-PB-6

This statement will be removed from the FEIS. The trees to be left should add to potential future habitat but will not necessarily "protect" existing habitat. See the response to comment ADFG-11.

Forest Service Response to USFWS-PB-7

The DEIS did state that the deer habitat capability model shows a slight increase of deer numbers for Alternative 4. This is due to an error in the way the model was run. See the response to comment ADFG-37.

Forest Service Response to USFWS-PB-8

The FEIS includes a timing restriction for cranes in Unit 5 (April 1 to June 15) but no restrictions for geese. Neither species is a Species of Concern and protection of these species is not considered necessary in the Forest Plan. The area is not considered a significant area for waterfowl, as discussed in the Forest Plan.

Forest Service Response to USFWS-PB-9

Under Option B, the roads would be closed after harvest. This would reduce long-term effects from these roads to a low level. For the most part, units included in the action alternatives do not access the higher-value winter habitat in the Project Area, based on the modeling done for the project. We believe that the basic conclusions of the EIS are correct. In the Selected Alternative, harvest prescriptions were modified in Units 5 and 6. These units are the only modeled high value deer winter habitat in the Project Area proposed for harvest. Harvesting the lower one-third of these units by removing 25% of the trees per acre over 9" DBH will greatly reduce effects to the deer winter habitat.

Forest Service Response to USFWS-PB-10

The character of many timber stands on Zarembo Island is strongly influenced by the infrequent but catastrophic wind storm events. These stand replacement events have produced even-aged and multiple cohort stands of windthrow origin. These types of stands are especially common in the Nesbitt Ridge and Vial Creek areas within the Skipping Cow Project Area. The timber harvest prescriptions are designed to mimic, to the extent possible, the ecological processes found within these natural stands. This is done by leaving various amounts of trees within the managed stands to mimic the structural components found in natural even-aged and multiple cohort stands of windthrow origin. It is also accomplished by varying the size and shape of harvest areas to imitate the vegetative complexity of the natural landscape on Zarembo Island. It is not the objective, however, to regulate the amount or rate of timber harvest to correspond to the rate of natural disturbance from blowdown.

Forest Service Response to USFWS-PB-11

For the most part, the timber harvest and road construction proposed in the Vial and Middle Meter Bight watersheds are not proximal to fish streams; particularly downstream Class I reaches. Although these watersheds contain proportionally more steep slopes and headwater streams than the Nesbitt Creek watershed, it would be incorrect to characterize these watersheds as inherently unstable or highly sensitive to disturbance when compared to the range of watershed conditions present in Southeast Alaska. We have field reviewed roads and harvest units proposed on steep slopes to ensure that the standards and guides are appropriately applied to minimize the risk of impacts to Vial and Middle Meter Bight fisheries.

Forest Service Response to USFWS-PB-12

The FEIS and ROD unit cards contain detailed information on Class IV stream protection. The road cards include some Class IV stream information, but most of these streams do not require site-specific evaluation for structure design. Standard Best Management Practices (BMPs) are applied during road location and structure installation on all Class IV streams.

Forest Service Response to USFWS-PB-13

Fish stocks on Zarembo Island are listed in the FEIS, Chapter 3, under the Fisheries and Watersheds Introduction (was on page 159 of the DEIS). Project-specific monitoring is discussed in Appendix E. This includes unit-specific monitoring for fisheries, stream buffers, and road effects. This is in addition to Forest Plan monitoring.

Forest Service Response to USFWS-PB-14

We do not agree that leaving 20 to 60 trees over 9 inches DBH, plus many smaller trees, will have no greater value for wildlife than clearcutting. Also see the response to comment CWP-20 for effects on wildlife. Two of the four action alternatives have prescriptions other than clearcutting. The range of prescriptions varies from cutting 25 percent of the trees over 9 inches DBH to cutting approximately 90 percent of the trees over 9 inches DBH. The range seems broad and consistent with the Forest Plan. The decision maker can select any of these alternatives or an alternative that combines aspects of different alternatives. Given the wide range of alternatives, we do not feel that the creation of additional alternatives is necessary in order to provide the decision maker with an adequate range of alternatives in order to make a decision.

Forest Service Response to USFWS-PB-15

This has been changed in the FEIS.

Forest Service Response to USFWS-PB-16

Road 52008 is an old number for a portion of Road 6594. This has been corrected in the FEIS.

Lori Morgan
1951 Hartnell Ave. # 3
Redding, CA 96002-5006

REDDING CA
PM
960
1999

The best alternative for the Skipping Cow Timber Sale is Alternative 1 (No action). All old-growth trees, riparian, and roadless areas should be off-limits to any type of logging (including helicopter logging). The Forest Service's job is to protect America's forests for future generations and it's native wildlife, not make them into tree farms or deserts. You work for me and the American public, not the timber barons.

All commercial logging should be eliminated on Americas greatest rainforest, The Tongass National Forest. Keeping America's Tongass National Forest pristine is more economical in the long run than cutting it down just for short-term profits.

Thank You
Lori Morgan

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USA 20

JERRY JORDAN
ATTN: SKIPPING COW EIS
USDA FOREST SERVICE
P.O. BOX 51
WRANGELL, AK 99929

Letter 7
Lori Morgan (LM)

Forest Service Response to LM-1

Your comments on the need to eliminate commercial logging on the Tongass National Forest are noted.

BILLIE SMITH
3031 BEAUCHAMP AVENUE
DALLAS, TEXAS 75216

DEAR TEAM LEADER JERRY JORDAN
I AM PLEASED THE THE ALTERNATIVE
5 IS YOUR ~~DISI~~ DECISION FOR THE
SKIPPING COW TIMBER SALE
I WOULD ALSO BE PLEASED IF
NO TIMBER CUT WOULD BE YOUR
DECISION. I HOPE YOUR IF YOUR
DECISION TO TIMBER CUTTING
THAT IT WILL BE A SMALL AMOUNT
AND THAT WILDLIFE AND ALL
ORTHER RESOURCES ~~AN THE AREA~~
WILL BE PROTECED IN THE AREA
OF SKIPPING COW.

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OCT 1 1999
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THANK YOU
BILLIE
SMITH

BILLIE SMITH
3031 BEAUCHAMP AVENUE
DALLAS, TEXAS 75216

DEAR STEVE BRARY DISITRICT RANGER
I HARDLY AGREE WITH YOUR DECIDING
ON ALTERNATIVES. FOR THE TIMBER
CUTTING. IF I HAD MY WAY NOT BE
TIMBER AT ALL WOULD BE CUT. I
ASK YOU TO LET THE TIMBER BULD
ROADS MY HOPE IS THAT YOU WILL
DEZIDE NOT TO LET ANY TIMBER
CUT IN THE SKIPPING COW AREA
BE CUT. THERE IS A LOT OF
WILDLIFE IN THE AREA THAT COULD
BE HARMED BY TIMBER CUTTING

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OCT 1 1999
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THANK YOU
BILLIE
SMITH

Letter 8
Billie Smith (BS)

Forest Service Response to BS-1

Your comments on the need to protect wildlife and all other resources are noted.

Forest Service Response to BS-2

Your preference that we not cut trees is noted.

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FOREST SERVICE

Alaska Forest Association, Inc.
111 STEDMAN SUITE 200
KETCHIKAN, ALASKA 99901-6599
Phone 907-225-6114
FAX 907-225-5920

September 29, 1999

Steve Brady, District Ranger
Attn: Skipping Cow EIS
USDA Forest Service
P.O. Box 51
Wrangell, AK 99929

RE: Skipping Cow Timber Sale DEIS

This letter is the Alaska Forest Association's (AFA) response to the Skipping Cow Timber Sale Draft Environmental Impact Statement (DEIS), Tongass National Forest. AFA has approximately 90 members and 200 associate members throughout Alaska, accounting for more than 1,400 direct year-round job equivalent employees in Southeast Alaska. AFA, its members, their employees and the timber dependent communities of Southeast Alaska depend on the Forest Service to provide economic timber sales of sufficient volume to meet the needs of the Southeast Alaska timber industry.

AFA has reviewed the Skipping Cow DEIS published and distributed in June 1999. AFA supports the Skipping Cow project and recommends a modification of Alternative 3 as the selected alternative (see discussion below). AFA looks forward to the successful implementation of the Skipping Cow Timber Sales project because it will help the Tongass National Forest meet all the goals set forth in the Tongass Land Management Plan (TLMP), including production of sufficient timber to meet annual and planning cycle market demand from the Tongass National Forest under provisions of the Tongass Timber Reform Act (TTRA).

AFA #1

Purpose and Need

AFA supports the "Purpose and Need" statement for the Skipping Cow Timber Sale project set forth on pages 4 & 5 of the DEIS and supported by the narrative in Appendix A, particularly the following:

1) "manage the Tongass timber resource for production of saw timber and other wood products from suitable timber lands made available for timber harvest, on an even-flow, long-term sustained yield basis *and in an economically efficient manner"* (emphasis added);
2) "seek to provide a timber supply sufficient to meet the annual market demand for Tongass National Forest timber, and the demand for the planning cycle;"
3) "maintain and promote industrial wood production from suitable timber lands, providing a continuous supply of wood to meet society's needs;" and

AFA #2

AFA Comments on Skipping Cow Project DEIS
September 30, 1999

Page 1

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4) "produce desired resource values, products, and conditions in ways that also sustain the diversity and productivity of ecosystems" on the Tongass National Forest. #2 Cont

Further, AFA suggests adding two additional statements to the purpose and need statement, as set forth in the DEIS for the Kuakan Timber Sale projects, as follows:

AFA #3

1) help provide a diversity of opportunities for resource uses that contribute to the local and regional economies of Southeast Alaska; and
2) support a wide range of natural-resource employment opportunities within Southeast Alaska communities.

The Skipping Cow Timber Sale will provide important pipeline volume to support Southeast Alaska's existing and future timber industry which contributes manufacturing jobs to the regional economy.[1] It is therefore an important part of the sales program proposed by the Forest Service to satisfy the requirements of TTRA, §101.[2] The Forest Service, in TLMP, relied on *Timber Products Outputs and Timber Harvests in Alaska: projections for 1997-2010*, by David Brooks and Richard Haynes (the 1997 Brooks & Haynes report). AFA believes the 1997 Brooks & Haynes report to be deficient in its analysis of the present and future demand for Tongass timber. The FS should acknowledge the timber industry's needs and attempt to provide the maximum economically feasible volume from the Skipping Cow project. While a project-level EIS is not the place to present a full-blown demand analysis, the following information should be noted and incorporated into the FEIS for the Skipping Cow Timber Sale project:

AFA #4

- Uncut timber under contract ("pool three"[3]) as of August 31, 1999 is 325,170 mmbf, according to information released by the Region 10 office of timber management in late September, 1999;
- the current installed normal operating capacity of sawmills served by the Tongass National Forest is 355.5 mmbf, and the manufacturing facilities are currently operating at less than 50% of normal operating capacity;[4]

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[1] See the discussion of the "Three Pools" concept in Appendix A, p. A-6.

[2] See discussion of timber demand in the DEIS, pp. 53-56 and Appendix A, pp. A-15 and 16. While AFA agrees with much of what is contained in the Timber Demand section of Appendix A, we note that it understates the installed mill capacity in Southeast Alaska, placing it variously at 241 mmbf and 281 mmbf. Actually, normal operating capacity of the installed sawmills in the region is 355.5 mmbf as noted in the text of this letter and the attachment thereto.

[3] See Appendix A, page A-6.

[4] See Attachment 1.

AFA Comments on Skipping Cow Project DEIS
September 30, 1999 Page 2

- the Forest Service should consider the potential for an expanding timber industry when calculating timber demand from the Tongass. For example, as of this date it appears certain that a new veneer production facility will be built and operated at Ward Cove by Gateway Forest Products,[5] thus increasing the Tongass-dependent installed mill capacity and demonstrating an aspect of demand not encompassed by the 1997 Brooks and Haynes report;
- in their 1997 analysis, Brooks and Haynes offered three scenarios varying from a low demand of 133 mmbf to a high demand of 156 mmbf. All these scenarios are well below the current normal operating capacity of Southeast Alaska's sawmills, and a sales program that is constrained by the Brooks and Haynes estimates will frustrate the efforts of Southeast Alaska's forest products manufacturers to respond to changing market opportunities;
- World demand for wood far exceeds the biological yield of the Tongass National Forest. Market demand is unlimited for products from Tongass-type timber. The principal limitation on the manufacturing capabilities of sawmills in Southeast Alaska in addressing the demand for products manufactured from Tongass timber is the volume of economic timber made available by the Forest Service; and
- the Forest Service is in direct control of the timber supply needed by the domestic processing timber industry in Southeast Alaska, and the agency should recognize that every board foot of volume made available at the project level is important since the only real constraint on industry's ability to develop new markets for Alaska sawn products is supply.

AFA #4 cont

Visual Resources

The DEIS points out that some of the harvest units proposed for the Skipping Cow project area are visible from Alaska Marine Highway routes.[6] AFA recognizes the importance of protecting important scenic values in the Tongass as seen from "popular roads, trails, marine travel routes, recreation sites, bays and anchorages,"[7] but suggests that a balance of interests must be factored into the interpretation of scenic values based on the overall opportunities presented by the vastness of the Tongass National Forest. Given the limited number of acres in which timber harvest is allowed under the recently revised Forest Plan (1999 Record of Decision), the Forest Service must seek to maximize the harvest on those areas to the greatest extent possible under applicable laws. To meet the management object of supplying sufficient timber to meet market demand will take the entire Allowable Sale Quantity provided for in the Forest Plan. To reach this goal, areas such as Zarembo Island should be managed as single use timber production areas. Zarembo Island currently has many

AFA #5

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[5] The timber demand discussion in Appendix A should be amended to include this fact.

[6] DEIS, pp. 201ff.

[7] See the Kuakan Timber Sale DEIS, p. 1-5.

roads and an established infrastructure. The reduction in the timber base resulting from the 1999 TLMP ROD has resulted in the necessity to utilize all of the Non-Interchangeable Component 1 (NIC 1) timber areas to meet the ASQ.[8] Single use management will permit a larger contribution of volume to the annual harvest and provide a better chance of producing economic timber offerings. There is no longer a large enough base of available Commercial Forest Lands to manage every acre for every use.

In areas designated "Scenic Viewshed" within the project area, the Forest Service should attempt to address VQOs in ways that have the least impact on the productive capabilities of those areas. This attempt should include non-significant plan amendments, moving acres from "Scenic Viewshed" to "Timber Production," where on-the-ground evaluations indicate that the boundaries have been misplaced and the acreage in question is *not* visible from "popular" roads, trails, etc. This approach is consistent with Plan implementation discussions held between the Forest Supervisors and industry representatives in 1997 and 1998.

AFA #5 cont.

AFA supports a modified Alternative 3 as the Preferred Alternative

Alternative 3 provides TLMP-required environmental protection and mitigation as well as what appears to be an opportunity for an economic timber sale. Multiple use considerations are adequately addressed in Alternative 3. Wildlife, fisheries, subsistence, cultural, visual and recreational concerns are minimized by protective measures built into this alternative.

The DEIS clearly indicates that Alternative 3 will return the greatest value to the treasury of the alternatives considered and is the only alternative that provides a net positive return even under a low market scenario.[9]

AFA #6

AFA has previously provided to the Forest Service suggestions for helping ensure economically viable timber sales from the Tongass timber sale program. Alternative 3 appears to incorporate some of these ideas, thus potentially resulting in economically viable timber sales on Zarembo Island.[10] The other alternatives set forth by the DEIS (with the

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[8] See DEIS, Appendix A, pages A-4 through A-14.

[9] DEIS, Table 2-5, p. 40.

[10] While this is stated in the plural, AFA suggests that the Forest Service offer the entire volume in the Skipping Cow project area as a single sale to minimize overall mobilization and de-mobilization costs. Due to its location, the project is not likely to be an appropriate site for smaller sales to address the needs of small operators. Cf. comment below under the heading, "General comments on sale economics."

possible exception of Alternative 5) are unlikely to result in a sale with sufficient value to be attractive in a mid-market scenario.

AFA suggests modifying Alternative 3 by eliminating Unit 11. This will partially address the strategy of advancing into the wind to minimize windthrow, as discussed in the DEIS.[11] To compensate for the loss of volume, Unit 8 should be enlarged to encompass the area and the harvest prescription described in Alternative 5. This configuration of Alternative 3 is compatible with information provided in the Skipping Cow DEIS, is within the discretion accorded to the Forest Service under NEPA and would be consistent with the project goals and the revised TLMP.

AFA #6 cont

AFA notes that recovery per mile of system roads is estimated in Alternative 3 at 2.07 mmbf, and at 1.51 mmbf per mile of total roads. The latter will be improved slightly by AFA's suggested modifications. The Forest Service should also consider using the 299 Road Standard as often as feasible to further minimize construction costs. This is especially appropriate in areas where the agency intends to close roads after harvest. The use of Road Management Option B is not affected by AFA's proposed modification to Alternative 3.

General comments on sale economics

1. Where TLMP S&Gs require structure to be left in a unit, the Forest Service should, to the extent feasible, meet the retention requirements by leaving unmerchantable and low value timber. AFA #7

2. Among other factors, the Forest Service should consider logs per mbf, volume per acre and recovery per mile of road when evaluating the economics of each timber sale project, since viable economics is as important an issue as volume in making these sales attractive to potential purchasers. AFA #8

3. Because there are no communities or micro-mill operators resident on Zarembo Island, the Forest Service should offer the entire volume of the Skipping Cow project in a single sale or in a maximum of two sales. Economies of scale are important in meeting the needs of operators likely to bid on sales in more remote locations. AFA #9

The Alaska Forest Association appreciates the opportunity to participate in the planning of the Skipping Cow Timber Sale project. Please contact me at (907) 225-6114 if you have any questions concerning these comments.

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[11] See DEIS, pp. 137-146.

AFA Comments on Skipping Cow Project DEIS
September 30, 1999 Page 5

Sincerely,

Jack E. Phelps
Executive Director

Attachment: Summary of Sawmill Capacity in Southeast Alaska

Attachment 1

Summary of Sawmill Capacity in Southeast Alaska
July 8, 1998

Annual Normal Operating Sawmill Capacity (mmbf)*

LPC Annette Hemlock	70
Jim Ensley	5
Herring Bay	9.5
Icy Straits	10
The Mill	10
M.I.T.E.	10
Pacific Rim Cedar	7
Seley Corporation	24
Various small mills	10
Viking Lumber	40
LPC Ward Cove	50
SBL Wrangell	110
	355.5

* Volumes listed reflect capacity, not recently attained operating levels.

Source: AFA telephone survey, conducted during the month of June, 1998.

Letter 9
Alaska Forest Association (AFA)

Forest Service Response to AFA-1

Your support for Alternative 3 is noted. The Selected Alternative is 5.

Forest Service Response to AFA-2

Your support of the purpose and need statement are noted.

Forest Service Response to AFA-3

Your suggested addition to the purpose and need statement has been made in the FEIS. We do agree that the project will add to the diversity of opportunities for resource use and that the project will help support employment.

Forest Service Response to AFA-4

The FEIS includes an updated economic analysis that reflects the most current Tongass-wide situation. (See FEIS, Appendix A.)

Forest Service Response to AFA-5

Your recommendations for managing the visual resources are noted. Additional trees would not be left in order to meet visual resource concerns in this sale. However, the location of leave trees would be modified in some cases.

Forest Service Response to AFA-6

Your comments on why Alternative 3 should be selected and your recommendations for modifying it are noted.

Forest Service Response to AFA 7

Your comments on leaving unmerchantable or low-value trees to meet structure requirements for wildlife are noted.

Forest Service Response to AFA-8

Your recommendations on what to include in evaluating economics are noted. These factors were considered in the economic analyses for the project.

Forest Service Response to AFA-9

Your recommendation that the entire volume of the Skipping Cow project be offered in one of two sales is noted. It is likely that one sale will be offered, depending on the final volume estimate.

10/01/99 FRI 15:28 FAX 907 452 3805 KINKOS FAIRBANKS 001

cascadia wildlands project

Gabriel Scott
Alaska representative
289 [illegible] Turnaround
Fairbanks AK 99712
(907)457-5393

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Sept. 30, 1999

Steve Brady, district ranger
Wrangell Ranger District
Tongass National Forest
ATTN: Skipping Cow EIS
POB 51
Wrangell, AK. 99929

Dear Mr. Brady,

The following are the comments of the Cascadia Wildlands Project (CWP) regarding the Skipping Cow Timber Sale:

* Please pay attention at the ANILCA 810 subsistence hearings scheduled for this project. Local subistence users, who spend far more hours in "the field" than the Forest Service, deserve a prominent voice in this decision. CWP #1

* There is no need for this project. No economic, moral, legal or spiritual imperatives require trees being cut down in this particular area. CWP #2

<u>Subsistence</u>

This project's effects on subsistence resources would be unacceptable. Winter habitat for deer is adversely affected beyond what is necessary to meet society's want for wood.

The deer on Zarembo island appear to be being set up for a collapse. This project would add one more set of circumstances to help make that collapse catastrophic. The low-quality forage produced by clearcuts artificially inflates deer habitat for a short time (during summer and unusually mild winters). When that forage disappears, as a result of normal forest succession or a harsh winter, the deer population collapses. Any of the action alternatives would only add to the susceptibility of the deer population on Zarembo island to a sudden catastrophic collapse. This is so for a number of reasons: CWP #3

-forage available after clearcuts lasts only for a short time. Within 20-30 years, available deer forage declines dramatically below pre-harvest levels;

roads make it easier for wolves to kill deer, and complicate that predator/prey relationship (Person 1996);

-roads also make it easier for people to kill deer. A highly roaded Zarembo island would attract more hunters (both for subsistence and for sport), increasing pressure on the herd;

-the reduction of available winter habitat makes deer vulnerable to harsh winters (which, of course, are inevitable). Clearcuts do not provide winter shelter for deer, and they will die there when winter storms arrive.

Why aren't these issues addressed in the EIS?!

A few more concerns regarding subsistence:

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* what level of disturbance would logging have on hunters on Zarembo island? Would roads be closed during logging? Would certain areas be off limits? Might deer be chased away by chainsaws? CWP #4

* Page 127 of the DEIS suggests that hunters have moved to Zarembo island because of less success in other areas. What sort of cumulative effects analysis is the Forest Service doing with regard to shuffling hunters around this way? It seems like logging kills off all the deer in one place, leaving hunters to go to another— then that population collapses because of deforestation and the hunters move on. Ad infinitum. CWP #5

Have other timber sales on other islands evaluated their effect of increasing subsistence hunting on Zarembo island? What effect will this timber sale have (via. killing deer) on subsistence hunting on other islands? The cumulative effects portion of the DEIS (p. 134-5) dodges the issue.

* If the Forest Plan requirements for rural subsistence users will be met "just barely," (pg 135), then your "immeasureable" (Id) effect becomes pretty important. This action may not proceed until the requirement for rural subsistence is met. CWP #6

Critters

* Have you conducted surveys for endemic species per TLMP S&Gs? CWP #7

*CWP endorses road management "option B" to lessen disturbance to wildlife. But it is important to note that "closing" roads has limited utility. Habitat fragmentation, edge effects, & changes in wolf-deer relations are still consequences. CWP #8

* What evidence is there that corridors between Old-Growth reserves are effective at connecting them? CWP #9

*The FEIS should thoroughly evaluate the effects of helicopter logging. Those effects include increased risk of fuel spills, disturbance to wildlife, and exclusion of small timber operators. CWP #10

*Action alternatives would pose unacceptable risks to murrelet nests.

*Helicopters may destroy and will certainly disturb nesting murrelets. Harvest units and flight paths should be designed to avoid those birds and their homes. The DEIS inadequately evaluates this project's demolition of their home. CWP #11

*This project would have unacceptable impacts on goshawks. The DEIS does a good job of listing effects, but runs short on anayzing effects. What analysis was used to reach the conclusion that goshawks would not be affected? They are very sensitive to disturbance, and this timber sale is a profound disturbance. This bird has very good lawyers. Don't mess with it! CWP #12

*The DEIS underestimates the human wolf harvest. Illegal kills should be included to reach a scientific conclusion. CWP #13

*With regard to wolves, y'all should evaluate the effects of an increase in road density! A simple list, and the mathematical fact that you fall below .7 does little to inform the reader.

*pg. 107-8 state that immense amounts of black bear habitat will be demolished. What would be the effects of that? How important is that for viablility? Remember your requirement to disclose and evaluate effects of an action. CWP #14

* This project has a grossly underestimated and misunderstood impact on interior habitat, fragmentation and edge effect, and no analysis of what the effects of that fragmentation might be. CWP #15

*This timber sale would leave a huge lack of snags and woody debris in the area, especially when the cumulative effects of past harvests are considered. That would badly impact critters. CWP #16

*The DEIS analysis of Ospreys is grossly lacking. In fact, it doesn't qualify as "analysis." CWP #17

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*The Forest Service could and should easily avoid negative impacts to the Choris Bog Orchid. CWP #18

*The FEIS should more thoroughly evaluate the effects of human disturbance on critters living in the area. CWP #19

Information

* What scientific backing is there for the claims that partial cuts are better for critters? CWP #20

* Thanks for at least listing mitigation measures, but the NEPA requirement is still an analysis of the effectiveness of those measures. CWP #21

* Pg. 105 claims that clearcut gaps will speed regeneration of Old-Growth conditions. What science is there to back up that claim? CWP #22

* Many statements in the DEIS aren't cited. Please provide evidence for your conclusions. CWP #23

Cumulative Effects

*The Forest Plan in no way obviates the site-specific requirements of EIS's to analyze effects. (For instance, the Forest Plan couldn't have forseen this timber sale's impact on an emerging high-subsitence area.) CWP #24

*This is too much harvest in an already hard-hit area.

*Should evaluate disturbance effects in relation to past, present and future actions. When you add that all up, it is pretty substantial; CWP #25

*Information from past timber sales (eg. EIS, monitoring reports) should be included in the EIS. CWP #26

*If future salvage timber sales are a reasonably foreseeable effect of this sale, then those effects must be analyzed. CWP #27

The Rest

*Windthrow is clearly a concern. That must be compensated for in reserve S&G's. CWP #28

*Clearcutting (Shelterwood, etc.) does not mimic windthrow. CWP #29

*The TLMP G-11 referred to in the DEIS reveals some problems with the selected silvicultural methods. TLMP @G-11 states that even-aged cutting "requires a fairly windfirm species," and that the method is "is inappropriate in Old-Growth stands." CWP #30

*Helicopter logging decreases the available flexibility, as far as choosing leave-trees and landing sites goes. CWP #31

*Pg. 144 of the DEIS states that any future salvage logging would be evaluated according to NEPA, and is therefore nothing to worry about. That is misleading language, given the recent wave of CE (Categorically Excuded [from NEPA]) salvage sales offered in this district. CWP #32

If (as I suppose) those salvage sales are a likely consequence of this sale, then those impacts must be evaluated in this EIS.

Thank you for thoughtfully considering these comments.

Sincereley,

Gabriel Scott
Cascadia Wildlands Project
289 Teresa Turnaround
Fairbanks AK 99712
(907)457-5393

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Letter 10
Cascade Wildlands Project (CWP)

Forest Service Response to CWP-1

ANILCA 810 subsistence hearing comments are considered along with other comments. Comments primarily dealt with maintaining open roads to allow access for hunting and berry picking. No comments that were concerned with harvest were received at the ANILCA 810 hearing. All comments at the open house prior to the hearing perceived harvest as creating deer forage. If access were allowed, commentors felt that they would have an opportunity to harvest of some of the deer making use of the forage.

Forest Service Response to CWP-2

Please refer to Appendix A.

Forest Service Response to CWP-3

This is discussed in the FEIS, Chapter 3, Issue 3, under the Management Indicator Species in the Sitka Blacktail deer section (which was page 119-120 of the DEIS). Additional harvest units in the next entry, 25 to 30 years from now, would provide forage when harvest units from this project "grow-in" and no longer produce much forage. Thinning could also extend the forage producing period. The interaction of roads and deer is also discussed in the Subsistence section (pages 130 to 132 of the DEIS). Under Option B, roads would be closed. This would limit hunter access but there would still be some increase. Open road density of 0.7 mile per square mile is a condition that when exceeded could put wolves at greater risk (Ref. Appendix A, Attachment 1). As noted in the comment, there is evidence to indicate that roads make it easier for wolves to kill deer. Roads also make it easier for hunters, poachers, and trappers to kill wolves (FEIS Chapter 3, Issue 3, under the Alexander Archipelago Wolf section, and page 98 of the DEIS). All alternatives are under 0.7 mile per square mile. The lack of high value winter range and the high deer population (the likely result of a series of mild winters and abundant forage produced by past clearcutting) means that a harsh winter is the most likely cause of a reduction in the deer population regardless of the alternative chosen (pages 130 and 131 of the DEIS).

Forest Service Response to CWP-4

Some roads would be closed to the public during logging and areas with active logging operations would be off limits to the public. This would be done for safety reasons. The noise of chainsaws might cause some deer to move to other areas temporarily. However, deer often feed on the tips of felled trees during the early evening and early morning hours when loggers are not present. Past timber sales on Zarembo Island have not led to any known adverse effects on deer harvest. Increasing deer-hunter success noted in the EIS has been concurrent with active logging operations on the island over the past 20 years.

Forest Service Response to CWP-5

An analysis of hunting patterns over large areas is beyond the scope of this analysis or of other individual timber sales. These patterns were considered in the Forest Plan and by the Federal subsistence board. In contrast to the scenario you describe, hunter success on Zarembo Island has increased in recent years even as logging has continued. Significant portions of the island are not included in the timber base. The beach fringe and the old growth reserves contain much of the best deer winter range on the island.

Forest Service Response to CWP-6

The Selected Alternative concluded that this sale will not adversely affect subsistence.

Forest Service Response to CWP-7

Surveys for endemic species are not required on islands over 50,000 acres.

Forest Service Response to CWP-8

Your comment regarding Option B is noted. The Selected Alternative includes a modification of Option B which eliminates motorized traffic on Nesbitt Ridge, while allowing limited ATV access on Road 6594, 52032, and 52034.

Forest Service Response to CWP-9

Surveys indicate that old growth stands in the vicinity of corridors are being used by deer and small mammals (FEIS, Chapter 3, Issue 3, Old-Growth Forest, and page 79 of the DEIS). We believe that all alternatives provide for continued function of the corridors between the medium old growth reserves on Zarembo Island.

Forest Service Response to CWP–10

Effects are analyzed in the FEIS. Measures are included to mitigate the risks of fuel spills and adverse effects on wildlife (Appendix D of the FEIS).

Forest Service Response to CWP-11

No marbled murrelet nests were located in, or adjacent to, the proposed harvest units. The Tongass Land Management Plan contains mitigation measures to protect murrelet habitat. These include the extensive old growth forests protected in the two adjacent old growth reserves and buffer areas for nest trees in timber LUDs.

Forest Service Response to CWP-12

Goshawks were observed flying over portions of the sale area, but no nests were located. FEIS, Chapter 3, Issue 3, Queen Charlotte Goshawk section, (page 96 of the DEIS) discusses how the Forest Plan provides a combination of reserves and dynamic landscape management to provide goshawk habitat. The effects of the alternatives on goshawks are discussed as referenced above.

Forest Service Response to CWP-13

The main measures for effects on wolves are deer population and road density. These are discussed in the FEIS, Chapter 3, Issue 3, Alexander Archipelago Wolf section (pages 98 and 99 of the DEIS).

Forest Service Response to CWP-14

Effects on black bears are discussed in the FEIS, Chapter 3, Issue 3, Black Bear section, Effects subsection (page 108 of the DEIS). None of the alternatives would affect the viability of black bears. As noted in the FEIS, most of the change in habitat is due to the effects of new roads under Option A. These effects would be greatly reduced under Option B. Note that black bear populations on the island have historically been fairly low, as described in the FEIS.

Forest Service Response to CWP-15

We disagree. These effects are discussed in Chapter 3, Issue 3, Black Bear section of the FEIS and are displayed in Figures 3-1 to 3-5 (pages 80 and 89 of the DEIS).

Forest Service Response to CWP-16

Timber harvest will reduce snags in the harvest units. Woody debris would be provided over time by trees left within the units and adjacent to the units. Approximately two-thirds of the acres in the proposed harvest units are in the understory reinitiation stage of development. At this stage, there is a natural lack of snags and structural diversity.

Forest Service Response to CWP-17

No osprey nests were located in the Project Area (FEIS, Chapter 3, Issue 3, Sensitive Species section, Osprey subsection and page 113 of the DEIS). Osprey are not likely to forage or nest in the proposed units due to their distance from good fishing areas.

Forest Service Response to CWP-18

Comment noted. The Choris bog orchid has been removed from the Regional Forester's sensitive list because intensive surveys by Forest Service botanists have determined that it is more common than previously thought. The Alaska Natural Heritage Program botanists agree that the plant is not extremely rare and are no longer tracking its occurrences.

Forest Service Response to CWP-19

"Critters" are discussed in Chapter 3, Issue 3 of the Wildlife section in the FEIS (pages 73 to 120 in the DEIS). We believe that they have been thoroughly evaluated in conjunction with Forest Plan revision analyses, scientific reviews, and this project analyses.

Forest Service Response to CWP–20

Two reviews of partial harvest units are:

- Effects of Selective Logging on Deer habitat in SE AK: A Retrospective Study. June 1998. Kirchhoff and Thomson. Alaska Department of Fish and Game. Quick Summary: Light selection logging offers good potential for maintaining high quality winter habitat for deer while improving stand growth and yield. Optimally, prescriptions should strive to emulate natural disturbance regimes with respect to intensity, frequency, and scale of disturbance.
- May 27-28, 1998 Review of Alternatives to Clearcutting project at Hanus Bay. Chris Iverson, Gene DeGayner. Quick Summary: 25% retention provided significantly more wildlife habitat and biodiversity values than a conventional clearcut, impacts to wildlife and biodiversity values were minimal at 75% retention.

A number of studies have documented habitat differences resulting from partial cutting compared to clearcutting in the Pacific Northwest. FEMAT, 1993 discusses some of the results.

Forest Service Response to CWP-21

Mitigation measures are listed in Appendices B, C, and D; and throughout Chapter 3. Monitoring of these measures is discussed in Appendix E. The mitigation measures applied in the Skipping Cow project have been developed and refined through application and monitoring on various projects across the forest. They will continue to evolve as additional information is gathered through project and Forest Plan monitoring. BMPs and other standards and guidelines identified in the Forest Plan are monitored to determine if they are being implemented, and if implemented, to determine if they are effective in achieving the goals and objectives. An interagency group identifies the BMPs and other standards and guidelines to be monitored each year and develops the protocols used in the Annual Monitoring and Evaluation Report. The 1998 report indicates that most were effective. The report acknowledges that the effectiveness of some have not been determined; however, it indicates that it does not appear to be necessary to adjust these at this time. See the 1998 Annual Monitoring and Evaluation Report, May 1999, pages 16-25, 58 to 65, and 85 to 87. This report has been referenced in the FEIS.

Forest Service Response to CWP-22

One of the well-documented characteristics of old growth forests is large trees with very large limbs. Thinning or creating small openings in dense young stands allows the remaining trees to grow more quickly and to develop larger limbs. Speeding the development of larger trees can provide some of the structure found in old growth stands sooner that would occur naturally. A few of the many references documenting the structural characteristics of old growth forests are: Franklin and Spies, 1984; Franklin and Spies, 1991; FEMAT, 1993. Miller, et al., 1995 found that two-aged harvest systems enhanced species diversity and vertical structure. Beatty, et al., 1995 found that canopy gaps were important factors in wildlife habitat and biodiversity.

Forest Service Response to CWP-23

We believe that we cited the important points. It is not realistic to cite a reference for every statement in an EIS. Specific references can be supplied upon request, as in the responses to comments CWP-20 and CWP-22.

Forest Service Response to CWP-24

Site-specific effects on subsistence are analyzed on pages 130 to 136 of the DEIS. This has been modified somewhat in the FEIS to account for information gained through the ANILCA 810 hearing and through other comments.

Forest Service Response to CWP-25

Cumulative effects of past, present, and foreseeable actions are disclosed in the FEIS, Chapter 3, Issue 3, Cumulative Effects section; Chapter 3, Other Environmental Considerations, Cumulative Effects section, and the DEIS (pages 116 to 120, 134 to 136, 156 to 157, 176, 185, and 221 to 222) as well as in the Forest Plan.

Forest Service Response to CWP-26

The FEIS includes pertinent information on past sales, including road and harvest unit information that is used in the analysis.

Forest Service Response to CWP-27

As discussed in the Cumulative Effects section (FEIS, Chapter 3, Other Environmental Considerations, Cumulative Effects section, and page 221 of the DEIS), some windthrow is likely but where and when this will occur cannot be accurately predicted beyond what is discussed under Issue 5. Because we do not know the scale of the windthrow, nor its timing and location, we cannot develop a meaningful analysis.

Forest Service Response to CWP-28

The unit cards contain mitigation measures to protect no-harvest areas.

Forest Service Response to CWP-29

This is discussed under Issue 5. Clearcutting resembles catastrophic windthrow in some respects. All or most trees can be blown down in a catastrophic event. The main differences are the amount of soil mixing, the amount of down large wood on the site, and the lack of adverse effects from roads and yarding (unless the down trees are salvaged). Shelterwood resembles a windthrow event in which all the trees are not blow down. Other than that, the other differences listed for clearcutting also apply.

Forest Service Response to CWP-30

TLMP Appendix G-11 states that shelterwood is an inappropriate prescription "in overmature old growth stands where the trees are large" and that it requires "a fairly windfirm species." Under this prescription, the largest and best formed trees (usually 8 to 15 trees per acre) would be left until seedlings are established and then these "overstory" trees would be cut and removed. None of the alternatives prescribes a shelterwood harvest. Alternative 2 would leave 20 to 30 percent of the trees over 9 inches DBH, approximately 20 to 60 trees, depending on the stand. These would generally be mid-sized trees to reduce the risk of them blowing down. Many trees under 9 inches DBH would also remain.

Forest Service Response to CWP-31

We disagree, helicopter logging increases flexibility for choosing leave trees and landing sites. It is often used in thinning sales, when it is economically feasible.

Forest Service Response to CWP-32

Please see the response to comment CWP-27.

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FOREST CONSERVATION COUNCIL

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Santa Fe, NM 87505-2488
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September 30, 1999 *Sent by Regular Mail & FAX*

Steve Brady, District Ranger
Wrangell Ranger District
P.O. Box 51
Wrangell, AK 99929
FAX: 907.772.5895

RE: Comments on the Skipping Cow Timber Sale Draft EIS

Dear Mr. Brady,

Please accept the following comments by the National Forest Protection Alliance (NFPA) and Forest Conservation Council (FCC) on the Skipping Cow Timber Sale draft EIS. These comments are made on behalf of NFPA, FCC, and our individual, business, and organizational members.

The Skipping Cow Timber Sale is a wasteful public expenditure that will create more social and economic harm to citizens of Alaska and the American public than good, and exacerbate rather than improve ecological conditions. The project will damage social and economic uses and values associated with natural forests (including forests that are affected by beneficial natural disturbance) for the benefit of the timber industry, even though non-timber uses and values are far more important to local communities and the regional economy. The project will jeopardize the viability of species that thrive in interior forests, naturally disturbed forests and old growth through clearcutting and road building, intervene in natural disturbance processes that are vital to ecosystem sustainability, and degrade water quality and watershed condition. The analysis on which the Forest has relied is flawed and biased in a number of ways, rendering any potential decision arbitrary and capricious. Following are our specific concerns with the Skipping Cow Timber Sale and draft EIS. FCC #1

Cumulative Effects. The Forest Service has failed to adequately address the cumulative effects of this project and others on Zarembo Island. The Forest Service Environmental Policy and Procedures Handbook sets the standard for analysis of cumulative effects: FCC #2

> "Individual actions when considered alone may not have a significant impact on the quality of the human environment. Groups of actions, when added together may have collective or cumulative impacts, which are significant. Cumulative effects, which occur, must be considered and analyzed without regard to land ownership boundaries. Consideration must be given to the incremental effects of past, present, and reasonably foreseeable related future actions of the Forest Service, as well as those of other agencies and individuals."[1]

[1] FSH 1905.15,15.1.

IN the case of the Skipping Cow Timber Sale draft EIS, it is apparent the Forest Service has not fulfilled this direction. Instead, it has chosen to account only for the before and after conditions in the project area (see treatment of cumulative effects on old-growth forest, marbled murrelet, etc., pp. 117-120). Further, the Forest Service casually refers to future timber harvest on Zarembo Island with no attempt whatsoever to quantify cumulative effects, only a subjective assertion that habitat would "continue to be provided in the old growth reserves and in other protected areas." The Forest Service clearly runs afoul of its obligations under FSH 1905.15,15.1 to analyze cumulative effects in the planning area. The Forest Service cannot simply fall back on the Forest Plan ROD and the Final EIS (see p.p. 176 draft EIS). Cumulative effects are to be given full and adequate consideration at the project level. Several Issues receive no cumulative effects analysis at all. The Tongass National Forest is falling into a trend towards not adequately addressing cumulative effects. This is a larger trend, as evidenced by the recent findings of the USDA Office of Inspector General: FCC #2 ConT.

> "the incomplete [cumulative effects] analyses resulted from Forest Service not including the required discussion of past, present, and reasonably foreseeable future actions and their effect on the project area's environment."[2]

Socio-economics. Once again, the Forest Service has failed entirely to address any economic impacts outside of those directly associated with the agency and timber related employment. It is particularly troubling that the agency identified economics as its number one issue, yet, absolutely no attempt is made to evaluate recreation, subsistence, aesthetics, etc. No value at all is attributed to jobs and income outside of the timber sector. As with other projects planned on the National Forests of Alaska and throughout Region 10, the Forest Service has failed to complete an economic analysis of the Skipping Cow Timber Sale that provides the public with a full and fair accounting of net economic benefits. In fact, the socio-economic effects section of the draft EIS is one paragraph (pp. 224 draft EIS). FCC #3

Forest Conservation Council has raised these economic issues in the context of numerous appeals in Region 10 (see for example Sea Level and Canal Hoya appeals). We incorporate, by reference, these appeals for a more complete description of our issues on this subject.

Wildlife Viability. The Skipping Cow Timber Sale activities are likely to jeopardize the viability of species that find optimal habitat in interior forests, forests with well-developed structures, and forests naturally disturbed by wind and insects. These include threatened, endangered, and sensitive species, as well as management indicator species.

For many of these species, the Forest Service has no up-to-date population data describing population numbers, locations, and trends, nor monitoring data on which the agency can rely to determine that the actions proposed in the context of the Skipping Cow Timber Sale will maintain numbers and distribution of these species sufficient for insuring long term viability. Further, the TLMP does not guarantee the long-term viability of several wildlife species, leaving the burden to the site-specific mitigation and planning, however by planning the Skipping Cow Timber Sale as a categorically excluded project these site-specific issues are avoided. Because the Forest Service has no population data for most species adversely affected by the proposed management activities, and because what data there is suggests that such species are declining and otherwise at risk, the Forest Service runs afoul of viability and diversity requirements set forth in forest planning regulations. 36 C.F.R. § FCC #4

[2] USDA Office of Inspector General Evaluation Report. 1999. Forest Service Timber Sale Environmental Analysis Requirements, Washington, D.C. No. 08801-10-At. January 1999.

219.19 and § 219.26. Species for which the Forest Service must have population information to make viability determinations are threatened and endangered and Region 10 sensitive species, and in particular the goshawk. #4 cont.

Fragmentation. Habitat fragmentation will result from the Skipping Cow Timber Sale, and is an underlying cause of many of the adverse effects on native species. As such, habitat fragmentation deserves a rigorous analysis. Forest Service literature is replete with references regarding the adverse effects of fragmentation on forest habitats. Before the Skipping Cow Timber Sale decision notice can be signed the cumulative effects of fragmentation from this sale and other past and reasonably foreseeable future actions must be accounted for. The Forest Service has, in its possession, models and techniques for assessing the effects of fragmentation. One such model, the "Distributed Wildland Resource Information System" was developed in 1987 for use on the Forest Service GIS systems, and provides the Forest Service with the tools to evaluate fragmentation in regards to patch size, perimeter (edge) to interior ratios, and other variables. (Id) The Forest Service has applied such models in the past to gauge the effects of fragmentation in the context of timber sales affecting old growth pine and mixed conifer habitats in other regions. In the Augur Creek Timber Sale EIS on the Fremont National Forest in Oregon, for example, the Forest Service used its Mt. Hood National Forest Fragmentation Model to quantify the amount of interior and edge before and after proposed timber harvest.[3] On the Payette National Forest, the Forest Service used a fragmentation model to assess the effects on interior and edge mixed conifer forest before and after the proposed Deep Copper Timber Sale.[4] FCC #5

In the case of the Skipping Cow Timber Sale, the Forest Service has failed to apply any of these models, nor any technique for evaluating fragmentation and resulting edge effects.

Log Transfer Facilities and Marine Fisheries. LTFs have the potential of harming the immediate marine environment as well as the larger marine environment. Several petroleum discharges have been reported from LTFs and at least one has not met BMP 14.27.[5] Further, marine bark deposition below LTFs has exceeded either thickness or continuous coverage standards according to the Alaska Water Quality Standards. No information is provided in the Skipping Cow Timber Sale draft EIS concerning the condition of LTFs in the area and in particular the LTF proposed for use. FCC #6

Thank you for the opportunity to comment on the Skipping Cow Timber Sale. Please send FCC and NFPA the final Decision Notice and any supporting NEPA documentation.

Sincerely,

Bryan Bird, Executive Director
Forest Conservation Council
P.O. Box 22448
Santa Fe, NM 87505
505.989.7446

[3] USDA Forest Service, Fremont National Forest, 1991: Final Environmental Impact Statement for the Augur Creek Timber Sale.
[4] USDA Forest Service, Payette National Forest, 1990: Draft Environmental Impact Statement for the Deep Copper Timber Sale.
[5]USDA Forest Service. Annual Monitoring & Evaluation Report for Fiscal Year 1998. Tongass national Forest

Letter 11
Forest Conservation Council (FCC)

Forest Service Response to FCC 1

We disagree. Benefits are discussed in the FEIS, Chapter 3, Issue 1, Project Economics, and the DEIS under Economics (pages 51 to 61).

Forest Service Response to FCC 2

Cumulative effects of past, present, and foreseeable actions are disclosed in the FEIS, Chapter 3, Issue 3, Cumulative Effects section; Chapter 3, Other Environmental Considerations, Cumulative Effects section, and in the DEIS (pages 116 to 120, 134 to 136, 156 to 157, 176, 185, and 221 to 222) and in the Forest Plan.

Forest Service Response to FCC 3

The numbering of key issues has no relevance to their importance. Project economics is one of the five key issues for the Skipping Cow project but being listed first does not make it any more or less important than the other four key issues. The Skipping Cow project is a timber sale project; thus, it is appropriate to discuss timber economics. You state that no attempt was made to evaluate recreation, subsistence, or aesthetics. Subsistence is one of the key issues discussed in the FEIS, Chapter 3, Issue 4 (pages 121 to 136 of the DEIS). Visual resources (FEIS, Chapter 3, Visual Resources and pages 201 to 206 in the DEIS) and recreation (FEIS, Chapter 3, Recreation and pages 207 to 218 in the DEIS) are not key issues, but they were analyzed and documented.

You noted in your letter that you have raised these economic issues in numerous appeals in Region 10. As noted in the Regional Forester's letter to you regarding your appeal of the Canal Hoya project, you continue to confuse program level analysis with project level analysis. An analysis of the net benefits is appropriate at the forest plan level. Chapter 3 of the TLMP FEIS (1997) contains extensive analysis of the economic and social environment on the Tongass. The Skipping Cow project is being prepared, in part, to implement the Forest Plan. It is designed to be fully consistent with the applicable management direction and standards and guidelines of the Forest Plan.

Forest Service Response to FCC 4

We disagree. The Forest Plan has implemented a comprehensive conservation strategy to ensure long-term viability of species (TLMP, 1997). This project implements that strategy along with additional Record of Decision (ROD) standards and guidelines (see FEIS, Chapter 3, Issue 3, Wildlife Habitat, and page 73 of the DEIS). The project was reviewed by ADF&G, USFWS, and NMFS. None of the agencies suggested that the project would jeopardize the viability of any species. They specifically stated that no threatened or endangered species would be jeopardized (see the letters in this section). It is true that we do not have population data on many species, but there is no requirement that there be up to date population data for all species. Such data would be nearly impossible to obtain for many species. However, it is not true that the Skipping Cow Timber Sale is a categorically excluded project. The project is being analyzed in an EIS. Wildlife habitat is discussed in the FEIS, Chapter 3, Issue 3, Wildlife Habitat (pages 73 to 120 in the DEIS). However, population viability is more appropriate as a Forest Plan level analysis, not a project level analysis.

Forest Service Response to FCC 5

Fragmentation was addressed in the FEIS, Chapter 3, Issue 3, Wildlife Habitat, and in the DEIS on pages 73 to 90. The methods used to evaluate fragmentation are described in the FEIS, Chapter 3, Issue 3, Wildlife Habitat, and in the DEIS on pages 78 to 80. A geographic information system (GIS) system was used. The models you suggest are not considered to be applicable the Tongass National Forest. Fragmentation is expected in the matrix part of the Forest Plan conservation biology strategy.

Forest Service Response to FCC 6

This information was added to the FEIS.

NATURAL RESOURCES DEFENSE COUNCIL

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September 30, 1999

VIA TELEFAX AND FIRST CLASS MAIL

Jerry Jordan, Team Leader
Attn: Skipping Cow EIS
U.S. Forest Service
P.O. Box 51
Wrangell, AK 99929

Re: Skipping Cow Timber Sale Draft Environmental Impact Statement

Dear Mr. Jordan:

This is to let you know of the interest of the Natural Resources Defense Council (NRDC) in the Skipping Cow Timber Sale. We request that you send us a copy of any further Environmental Impact Statements (EISs), Records of Decision, and timber sale advertisements for the project.

To a large extent, problems with the Skipping Cow project can be traced to deficiencies in the revised Tongass Land Management Plan (TLMP). In developing the Skipping Cow project, we request that you review and consider the following documents: NRDC's joint administrative appeal of TLMP (along with the Sitka Conservation Society), Appeal No. 97-13-00-0108; Intervenor Comments to that appeal filed by The Wilderness Society, et al.; and the Request for Interim Relief for Timber Sale Projects Pending Resolution of the Tongass Land Management Plan Administrative Appeals, filed on July 31, 1998, by 13 conservation organizations. Copies of these documents, along with the associated exhibits, were furnished to the Region contemporaneous with their original filing with the Chief's office in Washington, D.C. If for some reason they are not otherwise available to you, please let me know, and NRDC can furnish you with copies directly. NRDC #1

Some of the draft's deficiencies are as follows.

- It is unlawful as well as extremely poor stewardship to decide to dismiss an action alternative that keeps intact all roadless areas in the vicinity of the project out of hand, without benefit of a comparative analysis. This mirrors a serious shortcoming of the NRDC #2

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TLMP EIS. We have reviewed the draft EIS's statement about alternatives eliminated from detailed study and find it inadequate to justify this omission. #2 cont

- Logging and road-building in the roadless portion of the project area are particularly harmful because of its position between two medium-sized old growth reserves, the integrity of both of which has been substantially compromised by past timber sales. NRDC #3
- Occurrence of and impacts on relatively rare volume classes 6 and 7 are neither revealed nor even acknowledged. NRDC #4
- The use of even-aged silviculture requires site-specific analysis and justification — not in primarily economic terms — as the optimal or best technique for areas in which it is used. NRDC #5
- Roads that may be used or kept open for uses other than logging require a Section 404 permit from the U.S. Army Corps of Engineers for wetlands impacts. NRDC #6
- The discussion of road impacts needs to account for unauthorized use of roads where closure methods are, or may be, ineffective, and for the possibility that funds for closure and/or maintenance will not be available. Both of these issues need to be discussed in the context of past history specific to the Tongass, including enforcement records for closure violations and the current and recent road maintenance backlog. NRDC #7
- Simply reporting conflicting user opinions about road impacts on subsistence practices is inadequate. The agency has an obligation to attempt to predict actual impacts that are not clear to users, both now and in light of reasonably projected future demand. NRDC #8
- Wind ecology-based analysis of forest disturbance in Southeast Alaska and its implications for choice of management strategies are both untested and controversial. This topic needs detailed discussion in any EIS, draft or otherwise, with a candid review of uncertainty and confidence levels. NRDC #9
- Corridors for wildlife use being assumed for the various action alternatives are facially inadequate, in light of the existing science. NRDC #10
- The importance of roadless areas to maintenance of sustainable fish stocks, and the impossibility of meeting desired aquatic future conditions listed in the draft EIS literally, are not properly revealed and discussed. NRDC #11
- For wolf conservation purposes the project area is the wrong geographic unit for NRDC #12

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calculating road density. #12 Cont.

- A sufficient rationale for the three year timber supply is missing. There is no documentation for the implication that this is a normal Forest Service practice outside Alaska. There is no discussion of actual market demand or anything else bearing on what annual cut level ought to be assumed for purposes of calculating the supply, and why. The need to sell as opposed to simply preparing timber sales is not critically evaluated. No discussion is offered of the potential downsides to the public and/or agency from offering large volumes during a down market that the purchaser in effect can log or let stand (including potential losses to the Treasury; the growing staleness of environmental documentation, and the loss of future management options). No justification is offered for the conclusory claim that this sale is "necessary" for the sale program. NRDC #13
- No effort is made to project whether high or low market values are likelier. NRDC #14
- Jobs estimates need clarification of what the time interval of employment is. NRDC #15
- Both in text and charts, assumptions are made that much or all past logging in the project area was in medium volume strata. This assumption must be carefully defended or abandoned; most experts view high volume as the norm for past logging. NRDC #16

Thank you for soliciting our input and considering these documents.

Very truly yours,

Nathaniel Lawrence
Senior Attorney

cc: Carol J. Jorgensen, Assistant Forest Supervisor

Letter 12
National Resources Defense Council (NRDC)

Forest Service Response to NRDC 1

Reference to your Forest Plan appeal is noted.

Forest Service Response to NRCD 2

Not building roads at this time is included in the No Action alternative. The reasons for not considering managing the entire Project Area with helicopter yarding only are discussed in the FEIS, Chapter 2, Alternatives Considered But Eliminated From Further Study section, and on page 20 of the DEIS. We believe that this explanation is adequate. We do not agree that not studying this alternative in detail is unlawful.

Forest Service Response to NRDC 3

The area considered for harvest is within a timber LUD. A discussion of why harvest is scheduled for this area is included in Appendix A. A discussion of connectivity between the reserves is included in the FEIS, Chapter 3, Issue 3, Old Growth Forest section, and displayed in Figures 3-1 to 3-5 (pages 73 to 90 in the DEIS). Option B would close all new roads and remove drainage structures in the Nesbitt Ridge area to mitigate damage to connectivity. Analyzing the effects of past sales within the old growth reserves is beyond the scope of this project. However, the size of the medium old growth reserves was increased to compensate for the existing harvest units within them.

Forest Service Response to NRDC 4

Volume classes 6 and 7 are included in the high volume strata. This strata is described in the FEIS, Chapter 3, Vegetation and Timber Resources, Volume Strata section, and on page 191 of the DEIS. The amount of high volume strata proposed for harvest under each alternative is listed on Tables 3-11 and 3-35 of the FEIS and the locations of high volume strata forest under each alternative are displayed in Figures 3-1 to 3-5 of the FEIS. This strata is important habitat for many species. Effects on these species are discussed in the Wildlife section.

Forest Service Response to NRCD 5

A site-specific analysis was completed. It is documented in the silvicultural prescription.

Forest Service Response to NRDC 6

Thank you for this information.

Forest Service Response to NRDC 7

We believe that the measures listed on the road cards for closing the proposed roads (Option B) will be effective. Road 52033 (Nesbitt Ridge) will be closed by removing the drainage structures, placing barrier boulders, and placing a barrier berm. The closure will be enforced with a Road Order prohibiting motorized use of the road. Two of the three streams from which drainage structures will be removed are in incised channels and are likely to be highly effective physical barriers. The terrain adjacent to the road is steep and extremely difficult, if not impossible, to negotiate, even with off-road ATVs. Some roads on Wrangell Island, which have roaded access from the community, have been closed. Empirical evidence has shown that the closures have been highly effective. The availability of funding for road closures is not an issue. Roads that are scheduled for closure would be closed by the timber purchaser as part of the timber contract. Road maintenance is the responsibility of the timber purchaser over the life of the sale, commensurate with use. The availability of future maintenance funds is unknown, but based on historical funding levels, there is no reason to believe that there will not be sufficient money to maintain the roads to the assigned maintenance level after harvest.

Forest Service Response to NRDC 8

This information is included in the Subsistence section. The information in the FEIS has been modified based on testimony given in the ANILCA 810 Hearing.

Forest Service Response to NRDC 9

Wind ecology is discussed in detail in the FEIS, Chapter 3, Issue 5, Wind Ecology (pages 137 to 146 of the DEIS). Backup information can be found in the reference material cited.

Forest Service Response to NRDC 10

The FEIS, Chapter 3, Issue 3, Old Growth Forest, and the DEIS (page 79) acknowledges that natural connections between these reserves are limited by topography and that they have been reduced by past harvest. The effects that each alternative would have on connectivity are discussed in the FEIS, Chapter 3, Issue 3, Old Growth Forest section and displayed in Figures 3-1 to 3-5 (pages 89 and 90 in the DEIS). See response to CWP-9.

Forest Service Response to NRDC 11

We do not agree that it is impossible to meet the desired aquatic conditions and have roads. The FEIS, Chapter 3, Fisheries and Watersheds, Fisheries section, Effects subsection (page 160 of the DEIS), discloses that road construction has a potential for affecting fish habitat and discusses the mitigation measures included to protect aquatic resources.

Forest Service Response to NRDC 12

We agree. That is why we also used Zarembo Island, Wildlife Analysis Area 1905. (see FEIS, Chapter 3, Issue 3, Alexander Archipelago Wolf and pages 97 to 99 of the DEIS).

Forest Service Response to NRDC 13

The need for this sale and how it fits into the sale program is discussed in Appendix A. The annual sale level and its effects on the market are Forest Plan issues and are beyond the scope of this analysis.

Forest Service Response to NRDC 14

We do not know which values will prevail over the next few years; therefore, we included the range of conditions likely to occur.

Forest Service Response to NRDC 15

As stated in the FEIS, Chapter 3, Issue 1, Effects section (DEIS, page 57), a comparison of total jobs was made rather than an estimate of jobs per year because of the variability and uncertainty of the sale life.

Forest Service Response to NRDC-16

We assumed that harvest was mostly in the high and medium volume strata (page 74 of the DEIS and in the FEIS, Chapter 3, Issue 3, Wildlife Habitat, Old Growth Forest). Medium (4,515 acres) is much more common than high strata (1,133 acres). Stands adjacent to existing harvest units are mostly medium volume strata. Therefore, we assumed that most of the harvest occurred in medium volume strata when we modeled changes in habitat over time.

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Southeast Alaska Conservation Council

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September 30, 1999

Steve Brady, District Ranger
USDA Forest Service
Tongass National Forest, Wrangell Ranger District
P.O. Box 51
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OCT 4 1999
FOREST SERVICE

Re: Comments on Skipping Cow Timber Sale DEIS

Dear Mr. Brady;

The following comments are submitted on behalf of the Southeast Alaska Conservation Council (SEACC) on the Skipping Cow Timber Sale Draft Environmental Impact Statement (DEIS). The Preferred Alternative (Alternative 5, Option B) would log 20.1 mmbf of timber and construct 14.6 miles of new roads, including roads into the South Zarembo roadless area (inventoried roadless area #237).

SEACC is a coalition of seventeen volunteer conservation groups in thirteen communities across Southeast Alaska, from Yakutat to Ketchikan, including the Wrangell Resource Council. SEACC's individual members include Alaska Natives, subsistence users, commercial and sport fishermen, hunters and guides, tourism and recreation business owners, small timber operators and high value-added wood product manufacturers, as well as concerned citizens from all walks of life. SEACC is dedicated to safeguarding the integrity of Southeast Alaska's unsurpassed natural environment while providing for balanced, sustainable use of our region's resources.

Introduction

Recent information shows that the Forest Service has considerable problems maintaining fish passage along existing timber roads. Given the fact that the agency hasn't shown it can take care of the current existing road system, it doesn't make sense to allow the construction of new roads in roadless areas, such as South Zarembo Island. Frankly, there are enough roads on Zarembo Island. We are disappointed that the agency hasn't even considered a "no new roads" alternative, as we requested in our scoping comments last year. Such an alternative would have responded to the significant issues regarding fish passage, wetlands, subsistence and watershed impacts. Even though such an alternative was not considered, the Forest Service can modify one of the existing alternatives to require no new road construction and select it in the Record of Decision. SACC #1

ALASKA SOCIETY OF AMERICAN FOREST DWELLERS, Point Baker • ALASKANS FOR JUNEAU • CHICHAGOF CONSERVATION COUNCIL, Tenakee • CUSTOMARY & TRADITIONAL GATHERING COUNCIL OF KAKE • FRIENDS OF BERNERS BAY, Juneau • FRIENDS OF GLACIER BAY, Gustavus • JUNEAU AUDUBON SOCIETY • LYNN CANAL CONSERVATION, Haines • LISIANSKI INLET RESOURCE COUNCIL, Pelican • NARROWS CONSERVATION COALITION, Petersburg • PRINCE OF WALES CONSERVATION LEAGUE, Craig • SIERRA CLUB, JUNEAU GROUP • SITKA CONSERVATION SOCIETY • TAKU CONSERVATION SOCIETY, Juneau • TONGASS CONSERVATION SOCIETY, Ketchikan • WRANGELL RESOURCE COUNCIL • YAKUTAT RESOURCE CONSERVATION COUNCIL

I. THE DEIS FAILS TO ADEQUATLEY SHOW THAT THE AGENCY IS EXEMPT FROM SECTION 404 OF THE CLEAN WATER ACT.

The Preferred Alternative requires the construction of 5.5 miles of roads across wetlands. In order to be able to build these roads across wetlands, the agency must either apply for a Section 404 permit or show that it meets the requirements to be exempt from such a permit. To be exempt from the permit requirements, the agency must show that the proposed activities satisfy the requirements of the 404 exemptions and avoid the exception to the exemptions (also known as the "recapture" provision). United States v. Akers, 785 F.2d 814, 819 (9th Cir. 1986). The Forest Service fails to meets its burden of proof that it is exempt from Section 404 permit requirements.

In order to qualify under the "normal silviculture" exemption, the proposed activities "must be part of an established ... silvicultural, ...operation..." 33 C.F.R. § 323.4(a)(1)(ii). All action alternatives call for expanding logging and roadbuilding activities into a currently unlogged, unroaded area. Because these alternatives will bring "an area into silvicultural use" and will "change the use of the land," the Forest Service is not entitled to a Section 404(f)(1)(A) exemption. While it is true that TLMP placed 97 percent of the project area in the Timber Production LUD, this classification does not establish a silvicultural operation. Since,"[t]he Forest Plan does not authorize specific projects," nothing in the Forest Plan commits this currently unroaded project area to roadbuilding and logging development. TLMP FEIS at L-60. TLMP "...does not itself authorize the cutting of any trees [in the project area]." See Ohio Forestry Assn v. Sierra Club, 140 L. Ed 2d 921 (1998). Furthermore, Undersecretary Lyons properly recognized the role of TLMP in project planning by stating,"[t]he Modified 1997 Forest Plan land use allocations and direction have some flexibility." 1999 ROD at 64 (emphasis added).

SACC #2 cont

To qualify for the "forest roads" exemption, the Forest Service must assure that road building activities are conducted in accordance with Best Management Practices (BMPs). The agency must establish that the BMPs will "assure that flow and circulation patterns and chemical and biological characteristics of the navigable waters are not impaired, that the reach of the navigable waters in not reduced, and that any adverse effect of the aquatic environment will be otherwise minimized." See 33 U.S.C. § 1344(f)(1)(E).

The DEIS claims that "[t]he use of BMPs in both construction and maintenance ensures that flow, circulation patterns, and chemical and biological characteristics of the wetland's water would be minimally impaired." DEIS at 184. Absent from the DEIS, however, is any information or analysis showing that the implementation of these BMPs will actually assure that these goals are achieved. In fact, the Forest Service lacks any credible scientific basis for establishing that agency BMPs will accomplish the statutory requirements that would entitle them to this exemption. According to recent agency documents, "[c]urrently, the Tongass NF does not have an approved method to evaluate the effectiveness of BMPs related to impacts of management activities to wetland functions and values." See Tongass National Forest: Annual Monitoring and Evaluation Report for Fiscal Year 1998 at p. 85 (hereinafter USFS FY98). The report goes on to acknowledge that the agency's evaluation of the effectiveness of the standards and guidelines adopted in the revised Tongass Plan for minimizing impacts to wetlands and their associated

SACC #3

SEACC's comments on
Skipping Cow Timber Sale DEIS
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functions and values is "inconclusive." Id. at 87. Furthermore, agency studies provide documentation of the lack of effectiveness of agency BMPs on every area in the Tongass: Chatham, Stikine, and Ketchikan.[1] The DEIS provides no supporting evidence that the agency will fully and properly apply these BMPs, or that these measures will effectively maintain the flow, circulation, or reach of affected waters, if implemented properly. SACC #3 Cont.

In the FEIS, the agency should reveal all monitoring information pertaining to existing roads in the project area. We understand that extensive road condition surveys have been performed on Zarembo Island. The information from these road condition surveys should be summarized and included in the FEIS. It would be easy to include this information in the tables showing fish passage structure in the Project Area. See Tables 3-21, 3-22. This information should shed some light on the effectiveness of current BMPs in assuring that flow and circulation patterns and chemical and biological characteristics of the navigable waters are not impaired, that the reach of the navigable waters in not reduced, and that any adverse effect of the aquatic environment are otherwise minimized. SACC #4

II. THE DEIS FAILS TO ADEQUATELY SHOW THAT THE PREFERRED ALTERNATIVE WILL COMPLY WITH ALASKA'S ANTIDEGRADATION REGULATION.

The Clean Water Act mandates that each state's water quality standards include an antidegradation policy. See 33 U.S.C. §§ 1313(d)(4)(B), (c)(2)(A); [§§ 303(d)(4)(B), (c)(2)(A)]. The United States Supreme Court has also interpreted the Clean Water Act's mandated state water quality standards to require an antidegradation policy. See PUD v. Washington Dept of Ecology, 511 U.S. 700, 718, 128 L. Ed. 2d 716, 723, 114 S. Ct. 1900 (1994). Alaska's antidegradation policy, 18 AAC 70.015, was approved by the EPA in 1997. See 18 AAC 70.015. SACC #5

The DEIS states that "[r]oad construction (especially drainage structure installation), road use, and road maintenance would inevitably introduce sediment to fish streams in any alternative." DEIS at 163 (emphasis added). Thus, the Preferred Alternative would require the degradation of the area's fish streams. Judging from past performance, see supra note 1, it is also quite likely that some of the Preferred Alternative's required fish culverts will block fish passage. To comply with NFMA, however, the Forest Service must assure that its management activities will not adversely affect fish habitat:

> "No management practices causing detrimental changes in water temperatures or chemical composition, blockages of water courses or deposits of sediment shall be permitted in these areas which seriously affect water conditions or fish habitat."

---

[1] See Riley & Paustian, Fish Passage at Selected Culvert Crossings on the Hoonah Ranger District Road System (Mar. 23, 1999)("Of the 19 Class II culvert crossings surveyed, 17 were judges to be partial or complete upstream barriers for resident fish species...."). See also USFS FY98 at 22 (Of 107 streak crossings on Class I streams studies on the Petersburg District, 50% of these culverts are assumed not to allow for the successful passage of fish; about 85% of the culverts on Class II streams are assumed inadequate for fish passage.). See also Sea Level Timber Sale FEIS at 3-120 ("Of the [40] streamcrossings requiring fish passage, 19 crossings were identified as failing to provide fish passage.")

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36 C.F.R. § 219.27(e)

In order to qualify for a variance from anti-degradation requirements and water quality criteria, the Forest Service must disclose sufficient evidence to support a finding that "allowing lower water quality is necessary to accommodate important economic or social development in the area where the water is located" and that "the resulting water quality will be adequate to fully protect existing uses." See 18 AAC 70.015(a)(2)(A)&(C). This submission is essential to support the Forest Service's finding that this project is consistent to the maximum extent practicable with the Alaska Coastal Zone Management Plan. The DEIS fails to provide sufficient information and analysis to support these required findings. SACC #5 cont.

III. THE FOREST SERVICE MUST COMPLY WITH EXECUTIVE ORDER 11990.

Executive Order 11990 prohibits construction in wetlands where practicable alternatives exist and requires that "all practicable measures" be implemented to minimize harm to wetlands. The Forest Service could have considered an alternative which does not require the construction of new roads. Without evaluating such a practicable alternative, the Forest Service lacks the authority to build new roads in wetlands. SACC #6

SEACC asked that a no new roads alternative be considered in our scoping comments. See Letter from Peggy Wilcox to Jerry Jordan (Jan. 22, 1998). In describing the agency's rationale for not considering such an alternative, the EIS states that such an alternative "would not have provided increased access for future timber sales, either roaded or helicopter" and that "the decision maker preferred to expand the road network at this time in order to enhance the economic viability of this sale and future sales." DEIS at 20. However, the agency fails to provide any economic analysis of future timber sales anywhere in the DEIS. The agency also fails to evaluate the cumulative effects of future timber sales along the expanded road network. Lacking this necessary analysis, the decision maker lacks a reasonable basis for deciding to expand the road network at this time. Moreover, nothing in the Purpose and Need statement requires the construction of new roads. The Forest Service should have considered a "no new roads" alternative because it would have met the Purpose and Need and it would have responded to significant issues raised in scoping comments. Without the consideration of such a practicable alternative, the Forest Service lacks a reasonable basis for concluding that all practicable measures have been implemented to minimize harm to wetlands. SACC #7

IV. THE DEIS FAILS TO FOLLOW THE RECOMMENDATIONS OF THE ANADROMOUS FISH HABITAT ASSESSMENT (AFHA) BY CONDUCTING A WATERSHED ANALYSIS. SACC #8

To compare the effects of various alternatives on watersheds, the DEIS simply lists the amount of logging and road construction in each watershed under each alternative. In comparing

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impacts, the agency assumes that helicopter yarding will result in less erosion and sedimentation than cable yarding, and that high retention logging prescriptions will result in less erosion and sedimentation. These statements make intuitive sense, but what scientific evidence is there to back up these assumptions? Other than a general sense of which alternatives will have more impact on fisheries and other watershed functions, the effects analysis presented in the DEIS provides very little site-specific analysis of the effects of various alternatives on fisheries and other watershed functions. Unit cards in the appendix only give the location of nearby streams, without giving any information regarding overall watershed impacts. In order to give decisionmakers and the public a better understanding of the site-specific effects of various alternatives, the agency should complete a cumulative watershed effects analysis, as recommended by AFHA.

The AFHA report concluded that three (3) very important protective measures were needed to ensure fish habitat protection, including "completion of cumulative watershed effects analyses to evaluate natural and human disturbances." *AFHA Report Synthesis* at 14. The report further elaborated that "[m]ore comprehensive watershed analyses comparable to those in the PACFISH Strategy, <u>if just applied on priority watersheds where timber will be harvested, will provide for both timber harvest and anadromous fish habitat protection</u>." *Id.* at 15 (emphasis added). This recommendation responded to problems identified recognized by the AFHA team and expert reviewers with <u>the existing project-level planning process</u>, including the failure to:

SACC #8 Cont.

- thoroughly evaluate potential cumulative watershed effects;
- have sufficient "project-scale inventories for conducting site-specific assessments in sale planning and layout;"
- take a "holistic approach in describing the important watershed functions and processes;"
- take a long-term view of the effect of clearcutting and roading on watershed processes and functions at the landscape scale; and

See AFHA Report, Appendix C, *An Evaluation of the Effectiveness of Current Procedures for Protecting Anadromous Fish Habitat on the Tongass National Forest* 38 (Sept. 1994). These experts concluded that conducting watershed analysis at the <u>front-end</u> of project planning would provide the Forest Service with essential information necessary to adequately protect fish habitat and watershed functions, and updating important resource inventories in a timely manner. *Id.* at 34. The DEIS for this timber sale, however, fails to include a watershed analysis and thus fails to ensure that fish habitat and watershed functions will be protected.

The recommended cumulative watershed effects analyses called for by AFHA would help the Forest Service determine:

> "... how best to manage watersheds with steep unstable slopes, highly productive fisheries, productive timber lands, important and sensitive wildlife resources, high-value recreation and visual resources, cultural resources, and other considerations. ... Watershed analyses would also provide for assessments and management approaches more consistent with site-specific ecological processes and functions, resulting in a systems approach to management."

AFHA Report Synthesis. at 12.

The AFHA Fish Habitat Analysis viewed watershed analysis as playing a critical role in providing the essential information needed for implementing the Revised Tongass Plan at the project level.

> "Logging system and transportation plans are the primary foundation for current timber-sale project plans. Current planning is often too narrowly focused on the design of individual harvest units and road segments, so the interdisciplinary team has difficulty addressing broad ecosystem management and cumulative effects issues. Current project planning relies heavily on information from reconnaissance resource inventories. Time and resources needed to validate these reconnaissance inventories and to collect site-specific information are often limited during project planning. The practical opportunities for adjusting unit and road designs during layout, to mitigate problems or concerns missed in planning, are somewhat limited. Watershed analysis provides a mechanism to interject essential information on watershed and fish habitat characteristics into the 'front-end' of project planning, and also provides a structured framework for updating needed resource inventory information in a timely manner."

SACC #8 Cont.

APHA, Appendix C, at 38.

The DEIS states that "[t]he Forest Service would conduct a more intensive watershed analysis if more than 20 percent of the watershed acres are younger than 30 years (TLMP FEIS, 1997: Appendix J-2)" and that "[n]one of these alternatives are close to this benchmark." DEIS at 176. TLMP does not excuse the Forest Service from following NEPA's mandate to consider cumulative impacts. By waiting until some uncertain later date to assess the cumulative impacts of logging and roading on a watershed, the Forest Service has flipped NEPA upside down. "NEPA procedures must insure that environmental information is available to public officials and citizens before decisions are made and before actions are taken." 40 C.F.R. § 1500.1(b) (emphasis added). Unless the Forest Service conduct comprehensive watershed analyses before approving any logging or roading in a watershed, it can not fulfill its duty to protect and conserve the watershed resource as required by NFMA and the planning regulations. *See* 16 U.S.C. §§ 1604(g)(3)(E)(i), (g)(3)(E)(iii), and (g)(3)(F)(v); 36 C.F.R §§ 219.27(a)(1), (a)(4), (b)(5), (c)(6), (e), and (f).

V. THE DEIS FAILS TO ADEQUATELY SHOW THAT THE SKIPPING COW TIMBER SALE IS NECESSARY TO MEET MARKET DEMAND FOR TONGASS TIMBER.

SAcc #9

According to Appendix A of the DEIS, "timber volume being considered in the Skipping Cow project Area is ... consistent with ...timber demand estimates by the Pacific Northwest Research Station, Brooks and Haynes, and Kathleen Morse." DEIS at A-17. This statement flies in the face of timber demand estimates provided by Brooks and Haynes, which estimates demand for FY 2000 to be between 96 and 130 mmbf. See Brooks and Haynes, Timber Products Output and Timber Harvests in Alaska: Projections for 1997-2010 (Sept. 1997). Timber from the

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Skipping Cow Timber Sale is not needed to meet market demand. If indeed the Forest Service intends to offer the entire 168 mmbf in FY 2000, this sale will provide timber in excess of market demand. The Forest Service must provide a reasoned basis for ignoring the demand estimates of Brooks and Haynes. SACC #9 cont.

The agency should also disclose the status of recent timber sale offerings. According to a memo prepared by the Forest Service, less than half of the timber volume offered in FY 1998 **and again in FY 1999** went unsold. See Memo, Status of FY 1998 No-Bid Sales Reoffered in FY 1999 (attached). Given the amount of timber from FY 1998 still unsold and the amount of uncut timber currently under contract, the agency needs to show why it makes sense to offer 168 mmbf in FY 2000. The Forest Service must give a better explanation of why there will be demand for the amount of timber planned to be offered in FY 2000, including timber from the project area. SACC #10

According to the largest private timber land owner in Southeast Alaska:

> For a variety of reasons, the timber market in which Sealaska sells its timber -- the Pacific Rim market -- remains glutted, even in the absence of the USFS's timber-dumping program. The market is particularly grim for hemlock ....
>
> The result is a market that can take no more; indeed, hemlock exports to Japan from North America have already declined by 80% since 1980....
>
> But despite all this, the federal government continues to force-feed the Pacific Rim market with surplus timber.
>
> The inevitable short-term result will be to further depress already eroded timber prices. ....

Letter from Loescher, President and CEO of Sealaska Corp. to The Honorable Ted Stevens (July 12, 1999)(attached).

The agency's conclusion that more timber from the Tongass is needed now to supply an overly saturated and price-depressed market is simply unreasonable. Instead of preparing and offering below-cost and deficit timber sales from roadless areas, the Forest Service should be investing its scarce resources in offering small sales to local operators off the existing road system.

VI. THE DEIS'S ECONOMIC EFFICIENCY ANALYSIS IS INADEQUATE.

As required by the Forest Service Handbook and the Revised Tongass Plan, the Forest Service performed an economic efficiency analysis for all action alternatives. The economic efficiency analysis is inadequate, however, because the agency failed to compare the total economic benefits of the project to the total economic costs. See FSH 2409.18, chapter 30, SACC #11

32.32. "Economic costs are the sum of the financial costs, non-market costs, and non-Forest Service costs." Id., sec. 32.24. The FSH further defines "direct" economic costs as including "negative impacts on resources that have an economic value." See id., chapter 10, 13.05.

Unfortunately, the Forest Service never quantified the non-market values or calculated the non-market costs resulting from implementing this project. The potential negative economic impacts from the approved project on the wildlife values of the project area, including opportunities for subsistence deer hunting, are simply not taken into account when evaluating the economic efficiency of this project. The Forest Service violated NEPA because the FEIS fails to ensure appropriate consideration of "presently unquantified environmental amenities and values." See 42 U.S.C. § 4332(2)(B). Analysis presented in the DEIS only addresses the costs and benefits of the sale to the timber operator. This one-sided analysis impairs the fair consideration of the adverse environmental and economic effects of this project by the public and decision maker by only evaluating the economic costs and benefits to the timber sale purchaser and agency.

SACC #11 Cont.

The agency's awareness of its obligation to take into account unquantified environmental amenities and values, such as the non-market value associated with maintaining subsistence hunting opportunities, is reflected in the FSH. According to internal agency directive and policy, "[n]on-market outputs are assigned monetary values ... only when excess demand exists for that non-market good." See FSH 2409.18, chap. 30, sec. 32.23, para. 1; sec. 32.24, para 1 ("Non-market costs occur if the project has a detrimental effect on a non-market output and there is excess demand for that output."). The "excess demand" caveat, however, does not excuse the agency's failure to use some method to quantify these non-market values in this project analysis.

VII. THE FOREST SERVICE LACKS A REASONABLE BASIS FOR CONCLUDING THAT THE PREFERRED ALTERNATIVE WILL HAVE LITTLE OR NO AFFECT ON SUBSISTENCE ACTIVITIES.

In its analysis of impacts on subsistence uses, the agency attempts to minimize the effects of the Preferred Alternative on subsistence activities. The Forest Service uses faulty logic and ignores important information in making a determination that the proposed timber sale will have a negligible effect on subsistence activities. The agency therefore lacks a reasonable basis for this conclusion.

SACC #12

The Forest Service reveals that hunting levels on Zarembo Island are at an all-time high. "It is likely that the current harvest of deer from Zarembo Island is at an historical and unsustainable peak." DEIS at 135. Zarembo Island is the most important deer hunting area for Wrangell residents and is increasingly important for Petersburg residents. Id. The DEIS also admits that these hunters will not be able to satisfy their demand for deer in those areas most important to them under all TLMP alternatives. Id. Given the importance of Zarembo Island to local hunters, one would assume the agency would take a conservative approach regarding impacting deer habitat. Instead, the Forest Service ignores the importance of the area, says that hunter success will decrease in the future regardless, and plans to log more deer habitat and build more roads.

According to the DEIS, "Zarembo Island ... has a relatively little amount of high value deer winter habitat." Id. Given the scarcity of high value habitat, the moderate value habitat should receive greater consideration. The 1999 TLMP ROD provides additional direction to safeguard important deer habitat. Undersecretary Lyons included a deer habitat capability standard and guideline in the ROD "so that the Forest has greater opportunity to emphasize the importance of deer winter range in project-level planning decisions." 1999 ROD at 29. Contrary to this direction, the Preferred Alternative plans extensive logging in the best deer habitat in the project area, the SW facing slope above Nesbitt Creek. Instead of placing higher importance on this deer habitat due to the scarcity of high value deer habitat on Zarembo as directed in TLMP, the Forest Service's proposal treats this habitat as expendable. In order to reduce impacts on subsistence hunters, the Forest Service must consider and select an alternative that truly minimizes adverse impacts to subsistence areas and resources. Such an alternative would employ only selection logging in these deer habitat areas and would not require the construction of new roads.

SACC #13

Conclusion

We are skeptical that this sale is necessary to meet demand for Tongass timber. However, if the Forest Service decides to proceed with this sale, we urge the agency to select a modified Alternative 4 which doesn't require any new road construction.

Thank you for accepting these comments.

Best Regards,

Marc Wheeler
Grassroots Organizer

SEACC's comments on
Skipping Cow Timber Sale DEIS
September 30, 1999

9

Letter 13
Southeast Alaska Conservation Council (SACC)

Forest Service Response to SACC 1

None of the proposed roads cross fish streams. Wetlands, subsistence, and watershed impacts are discussed below. See the response to comment NRDC 2 regarding the no roads alternative.

Forest Service Response to SACC 2

The U.S. Army Corps of Engineers (Corps) has regulatory authority over the discharge of dredged or fill material into waters of the United States, including wetlands, and is responsible for determinations under Section 404 of the Clean Water Act. Section 404(f)(1)(E) of the Clean Water Act provides that the construction or maintenance of forest roads for silvicultural activities is exempt from permitting under the Clean Water Act, provided that the road footprint is no larger than needed for removal of timber and provided roads are constructed and maintained in accordance with BMPs to ensure that: the flow and circulation of navigable waters are not impaired; that their reach is not reduced; and that any adverse effects will be minimized. The COE indicate that the Road 6594 crossing at MP 3.8 would not be exempt unless it provides for resident fish passage. We will design a structure at this site that provides for resident fish passage. The proposed roads in the Project Area avoid wetlands, to the extent practicable, and minimize impacts to wetland sites by constructing and maintaining roads in accordance with BMPs. In addition, roads would be constructed with a footprint no larger than needed for removal of timber. Accordingly, proposed roads in the Project Area would meet the requirements for the permitting exemption under Section 404(f)(1) of the Clean Water Act.

Forest Service Response to SACC 3

BMPs and other standards and guidelines identified in the Forest Plan are monitored to determine if they are being implemented, and if implemented, to determine if they are effective in achieving the goals and objective (see Monitoring Plan specified in Chapter 6 of TLMP). The results of monitoring determine whether changes in management direction are necessary. The Interagency Monitoring and Evaluation Group, which includes the Corps, identifies the BMPs and other standards and guidelines to be monitored each year and develops the protocols used in the Annual Monitoring and Evaluation Report. The 1998 Report indicates that most of the standards and guidelines for fish, wetlands, and soil and water resources are being implemented with little departure and are effective. The report acknowledges that the effectiveness of some of these standards and guidelines have not been determined; however, the report indicates that it does not appear to be necessary to adjust these at this time (see the 1998 Annual Monitoring and Evaluation Report, May 1999, pages 16 to 25, 58 to 65, and 85 to 87). The roads associated with this sale will be constructed and maintained in accordance with applicable BMPs and we believe that these BMPs are the most practical and effective measures available to minimize potential adverse impacts.

Forest Service Response to SACC 4

We have included some information from the 1998 road condition surveys in the FEIS. The roads in the Project Area were in very good condition; only a few problems were noted. We used this information to plan the reconstruction of Road 6594; specifically to install drainage structures that will pass fish in streams that we had previously thought were not fish-bearing streams.

Forest Service Response to SACC 5

The Skipping Cow FEIS, Chapter 3, Fisheries and Watersheds section and the DEIS (pages 159 to 176) discusses the potential effects of the proposed timber harvest and road construction on fisheries and watersheds. Direct effects on fish streams are avoided, although the FEIS and DEIS acknowledge that road construction, use, and maintenance will inevitably introduce some sediment into streams. The FEIS and DEIS state that the use of standard and site-specific BMPs will ensure that these impacts are short term and minimized to the extent feasible. Reasonable implementation with site-specific application and monitoring of approved BMPs is expected to comply with applicable state water quality standards.

Forest Service Response to SACC 6

Roads only crossed wetlands where another practicable alternative did not exist. As discussed in the FEIS, Chapter 2, Alternatives Considered But Eliminated From Detailed Study, Helicopter Alternative and on pages 20 and 21 of the DEIS, it is not practical to harvest the suitable timber in the Project Area without additional road construction. The area is designated for timber management by the Forest Plan and constructing new roads needed to manage the timber resources are part of the objectives for timber LUDs (FEIS, Chapter 1, Overall Direction for the Project and page 5 of the DEIS). Cumulative effects of past, present, and foreseeable harvests are disclosed in the DEIS (pages 116 to 120, 134 to 136, 156 to 157, 176, 185, and 221 to 222), in the FEIS, Chapter 3, Issue 3, Cumulative Effects; Cumulative Effects on Freshwater Resources; Other Environmental Considerations, Cumulative Effects, and in the Forest Plan.

Forest Service Response to SACC 7

The economic analysis of future timber sales is beyond the scope of this analysis. Foreseeable actions, including timber sales, are evaluated under Cumulative Effects.

Forest Service Response to SACC 8

The Skipping Cow FEIS, Chapter 3, Fisheries and Watersheds and the DEIS (pages 159 to 176) provides an adequate analysis of the potential effects on fisheries and watersheds. There could be advantages to conducting a more detailed watershed analysis within the planning area. However, early in the planning process, we decided that a more detailed watershed analysis was not warranted for the purpose of planning a timber sale in these particular watersheds on Zarembo Island. A review of the criteria suggested in Appendix J of the Forest Plan (page J-2) for conducting a more intensive, complex, and field-based watershed analysis supports this decision. Of the six criteria listed, only the first (high value of fish) could be considered as applicable to the Project Area. The generally gentle topography of the Project Area diminishes the inherent potential for erosion (second criterion) and minimizes the mass wasting hazard (third criterion). There are no threatened, endangered, or sensitive aquatic species known to inhabit the Project Area (fourth criterion). The area with second growth forest younger than 30 years amounts to far less than 20 percent of any major watershed (fifth criterion). The density of the road system and the number of stream crossings are less in the Project Area than in some other watersheds on the island (sixth criterion).

Field reviews of the Project Area indicated that the existing roads are in good condition; past harvest has affected only a few acres of riparian area; and there are very few landslides or other obvious natural or human-caused watershed disturbances. Furthermore, the riparian standards and guidelines are applied as described in the Forest Plan, with no modifications requiring justification through watershed analysis.

Forest Service Response to SACC 9

The need for this sale is discussed in Appendix A.

Forest Service Response to SACC 10

These have been included in Appendix A of the FEIS.

Forest Service Response to SACC 11

It is difficult to put a monetary value on "non-market" values. In the case of subsistence resources, the DEIS concluded that the alternatives would have little effect on these resources. It is interesting to note that all subsistence users that attended the ANILCA Section 810 subsistence hearing and open house supported additional roads and harvesting in order to maintain subsistence resource production.

Forest Service Response to SACC 12

We disagree. The Subsistence section (FEIS, Chapter 3, Issue 4, Subsistence and pages 121 to 136 of the DEIS) and the Subsistence Report contain detailed analysis of the issue and explain why we concluded that these alternatives will have little effect on subsistence. However, despite the fact that severe winters are likely to have a more significant impact on subsistence than the harvest proposed under these alternatives, we do include design features and mitigation to reduce the marginal impacts of harvest on subsistence. These measures are described in the Wildlife section of the EIS. They include: avoiding timber harvest in most high-value winter habitat, protecting

travel corridors, harvesting only 25 percent of the trees over 9 inches DBH in the lower portions of Units 5 and 6, and closing roads after harvest is completed.

Forest Service Response to SACC 13

None of the units proposed for harvest are on the west-facing slopes above Nesbitt Creek. Units 5 and 6 face south. The remaining units face east. Most of the area proposed for harvest is not high value habitat, based on the model. See the response to comment USFWS-PB-2.

Subsistence Hearings

Three people testified at the ANILCA 810 subsistence hearing held in Wrangell, Alaska on September 9, 1999. A copy of their testimony is included below, along with the Forest Service response. The following people testified at the hearing:

First Name	Last Name	City	State	Code	Pages
James A.	Stough	Wrangell	Alaska	JS	G-1 – G-4
Greg	Miller	Wrangell	Alaska	GM	G-2 – G-4
Bruce	Jamieson	Wrangell	Alaska	BJ	G-2 – G-4

Testimony

JS My name is James A. Stough (S-T-O-U-G-H). Ah, in the subsistence line, my, my concern is, ah, the taking away of the available hunting areas due to the removal of road and water barring, and ah, this pertains to old road or new developed road. Because I feel that they -- the old logging areas, or low [old?] road areas that were logged, that we were hunting in, changes in time due to the growth of vegetation -- that our hunting areas change with time. So I would like to see them develop some kind of criteria to, to leave this window of opportunity for the hunters to hunt in the old growth until it, old logging and old, older areas, until it becomes unfeasible, and as those dwindle away we want the accessibility to the new areas, and this is usually a window of a certain amount of years from zero to seven, whatever it is -- depending on the area, but, ah, that's my main concern as a hunter, and a person living here. **JS-1** Ah, one of the things that we haven't touched on, I think, since you're calling it subsistence, is, ah there is a number of berry gatherers that we've never even mentioned. Ah, there are quite a few people around here that I can think of that get berries. I don't know if I take more than my share, but I usually take 30 or 40 gallons every year **JS-2** over there. There is not usually in any specific area -- I don't know, whatever logging area it is, that happens to be developed first.

MG I'm not really supposed to ask questions, but I guess I should ... [going to ask about specific areas and so on, but JS goes on to supply this information without prompting]

JS That would be a concern of mine, you know, also, this access -- accessibility because, in the older areas it tends to brush over and you don't get the berry population unless it's in the newer growth. Taking you back in history, probably it's pretty much right, and ah, I think that's [?]. We 'd like to see these roads left open and left as a maintained -- so we could have the access to hunt, and accessibility to get to other areas to hunt. I mean, not all of us hunt on those, right off the pickups and then the immediate areas, but those areas also we lose the availability to get to the timber lines or the, or the muskegs, also, that are adjacent to these roads. That, that would be my mine concern, cause I said that the trend is now to eliminate a lot of that brush, and due to the old growth and the growth coming in, we're losing more and more [hunting area] all the time. And we don't want to see the deer population drop down. On the other hand, we feel it should be harvested if it is there.

MG Okay, and you can of course always expand on your comments later with written comments if you want to, and what I will try to do is to make sure that the transcript is available well before September 30, so you can see what you said, and see if you do what to add to it. Is there anybody else who'd like to make a formal statement?

GM I would. My name is Greg Miller (G-R-E-G M-I-L-L-E-R), resident of Wrangell. Resident of Alaska all my life. I'm 47. I've had, ah, some experience hunting on the Island of Zarembo in the last five years. The last couple, several years now I've had a pickup, a little pickup, over there and one of my first goals was to drive the island and get up as many roads as I could, and climb up on to the knobs as far as I could, and, and to take a look around and explore, and I've noticed that I found deer on most of the island, and the bucks have been all over the place, and you can find their buck rubs up on the tops of old growth, old **GM-1** overgrown logging areas, or even in the new logging areas -- fresh cuts. Um, my concern is, ah, gates on

the new roads. I think that we should have access to new cuts. I don't think that we should gate off newer areas because of big game hunting or trophy hunts or anything like that. I think that access should be equal to everyone. I think that the population of the deer on Zarembo is healthy and I don't think that's a problem right now. As far as the numbers go. And that's about all I have to say. GM-2

MG Okay, and the same thing is true. If you want to give a later comment, a written comment. Is there anybody else who wants to formally testify?

BJ Yeah. It's kind of not off on this, it's off on another issue.

MG Well, we can probably fit that in. I think we're running well within our time limit.

BJ Okay. Do I have to say my name and everything?

MG Yeah, if you would.

BJ Bruce Jamieson, resident of Wrangell, Alaska. Ah, the only complaint that I have is with the federal government, is -- they have a proxy system for the taking of deer on Zarembo Island, and southeast, and observing it I find that it is being very abused and if they want to keep subsistence on here it's proxy will have to be taken away, because too many hunters are going over there, taking too many deer, and it's just ruining the population over there. And the federal government should have a better control over it, because right now it's just a loophole for people just to go over to Zarembo Island and drive around on a four-wheeler, and shoot deer. And saying its for some elderly person. That's all I have to say. BJ-1

MG Well, that is something that you can certainly take up with the federal subsistence board, and you do have a regional subsistence advisory council ...

BJ Uh huh

MG ... that you can submit a proposal to, if you want to abolish the proxy hunt, either specifically on Zarembo or throughout the region. You can submit a proposal to them and have them try and look at it. I do know that many members of that advisory counsel are strong supporters of the proxy system, so you may run into a road block there, but it is certainly your right to go and try and have that reversed, and there is a formal system to do that with the federal system. Anybody can submit a proposal or modify something that has already been proposed.

BJ Okay

MG And I can help you with that. I don't have the form with me right now, but I know I have it back in my office. They just recently sent them out. So, I'll ... get you a ... put your name down with your address and I'll make sure that I'll send you back the process that you need to go through to try you know submit the modification you would suggest.

BJ Okay.

MG Is there anybody else, who would like to give any sort of statement? Again, it doesn't have to be -- nobody's gonna grade you on eloquence or anything else ... this is one way that we get an idea of how the public really feels about certain issues and how important issues are to them. And, it's not a voting system. I mean, it does not depend on how many people actually vote one way or the other, but on the other hand, it does help us see which issues are more important to people than others. So if you do have a strong feeling on subsistence issues and especially on road closure one way or the other, it probably is beneficial for you to make at least some kind of short statement, even if you are later going to write a letter at greater length that explains it more fully. But on the other hand, public testimony here carries no more weight than a later letter would, or any other sort of comment.

If there is no one else who would like to talk right now, what I'll do is I'll shut off the tape recorder. I will be here until nine o'clock if you want to talk to me off the record, I can still make a note of whatever your comments are and that will be made part of the formal record as well, it just won't be in the transcript [or attributed by name to any one specific person]. And I will also be in Wrangell all day tomorrow because I could not get a plane out until Saturday, so I'll be down at the Stikine Inn if you or somebody else you talk to wants to talk to me too, they can get a hold of me.

? I have a question, but I'll wait till we're off the record, all right?

MG Okay. Let me see if I can figure out ... [tape off at about 8:20 PM]

Attendance List

Greg Miller	PO Box 80, Wrangell AK 99929	874-3568
Michael Galginaitis		
Steve Brady	PO Box 2123, Wrangell AK 99929	874-2722
Randy Hojem	PO Box 23333, Wrangell AK 99929	874-3062
Jerry Jordan	PO Box 1977, Wrangell AK 99929	
James A. Stough	PO Box 1342, Wrangell AK 99929	874-3674
Bruce Jamieson	PO Box 1091, Wrangell AK 99929	874-3023
Ray Alt	PO Box 307, Wrangell AK 99929	874-3298
Bruce Smith	PO Box 1547, Wrangell AK 99929	874-2284
Mark McCallum	PO Box 191, Petersburg AK 99853	772-3075

James A. Stough (JAS) at the ANILCA 810 Hearing

Forest Service Response to JAS-1

Your comments about the importance of keeping logging roads open are noted.

Forest Service Response to JAS-2

Your comments on the importance of berry gathering to subsistence users are noted. This information will be added to the FEIS.

Greg Miller (GM) at the ANILCA 810 Hearing

Forest Service Response to GM-1

Your comments on the abundance of deer on the island are noted.

Forest Service Response to GM-2

Your comments about the importance of keeping new logging roads open are noted.

Bruce Jamieson (BJ) at the ANILCA 810 Hearing

Forest Service Response to BJ-1

Your comments on the proxy system for hunting deer on Zarembo Island are noted. However, regulations dealing with permits for subsistence hunting are beyond the scope of this analysis.

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